

Analysis of knee joint injury and prevention strategy of college basketball students

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Abstract: *Basketball in college physical education occupies an critical position, but during basketball teaching, in the standard course for many students have developed knee joint injuries which most are caused by inadequate warm-up exercise. In advance of basketball activity, it's necessary to prepare a scientific training plan and do enough warm-up exercises to reduce the risk of knee injuries.*

Keywords: *University; Basketball; Knee injury*

1. Introduction

Basketball is one of the most crucial training course in college sports courses, it is also a favorite sport for students. Basketball teaching can strengthen the students' physique, keep their physical and mental health, but also help students mastering the basketball practice methods and skills. However, many students were suffering from the injury of the knee joint due to the lack of warming-up exercises and other factors during the basketball training. Therefore, we will make a brief analysis of the knee injury and its prevention strategies for college students.

2. Summary of Basketball

Basketball, a hand-centered physical adversarial movement, which was started in 1891 and has specific requirements for the ground and the basketball shelves, is one of the core sports items in the Olympic Games. As we all know, China's Yao Ming and Michael Jordan and James Nai Smith of the United States are all getting outstanding achievements in basketball games. James Nestsmith was known as "the father of basketball" for the earliest basketball rules he made. Because of the high-intensity training and fierce competition, it's higher to basketball athletes physical quality standard. Practicing basketball can not only improve the sports level, but also cultivate courage and perseverance and abiding spirit.

Basketball sports have many characteristics that are not only closely related to life, but also very simple and feasible. (1)It is closely related to daily life: Both walking, running, jumping, or throwing are the essential skills that formed in life. The learning of these movements have a lot to do with the mastery of various basketball skills.(2)Universality of basketball sports :basketball is not only a kind of individual sport , but also a group sport.(3)Simple and feasible of basketball sports :there are very few restrictions for basketball sports which means that everyone can practice basketball in any relatively safe place without the limits of age or gender, Basketball games can even be played with only some simple equipment or in any simple venues.(4)Benefit for the physical and mental health: It's obvious that more basketball practice is conducive to improving people's physical quality level and promoting people's mental health . Basketball training plays a vital role in the process of improving physical and psychological health. First of all the training of basketball can comprehensively improve people's physical quality. More practice of walking, running, jumping, or other actions is conducive to enhances people's basic motor skills. At the same time, practice in the natural environment is conducive to strengthening human people's immunity and the body's external adaptability^[2]. According to some research, People who have long- term practice of basketball was proved that they have more strong aerobic metabolism ability compared with other people. This is because in the process of playing basketball, physical strength will be greatly consumed, and the metabolites will increase, which is conducive to promote blood circulation and heart function metabolism, and then deepen the depth of breathing and enhance lung capacity. Furthermore, Exercise will hone perseverance, and long-term basketball sports can enhance people's awareness of self-control. Meanwhile, the training content of basketball is relatively abundant, which is benefit for exercising people's willpower and cultivating

people's spirit of perseverance.

3. Research methods

This paper uses the methods of a questionnaire survey, literature data, logic analysis, and mathematical statistics.

4. Reasons of knee injury for students in college basketball courses

4.1 Conservative ideas and concepts of training

China has long been a sports power rather than a leading sports nation, Chinese athletes have strong competition and elite spirit in the sports competition, which affect college basketball training and leading to a strong sense of competition between teachers and students. Under the influence of these concepts, there are typical problems of high intensity and frequency in basketball training among the universities, which leads some students have to bear intense basketball training and followed by knee injuries.

4.2 The neglect of the basic skills

During the basketball training, only by mastering the basic skills can we enhance the accuracy of our posture, movement, and other aspects, however, some basketball teachers are anxious to achieve quick success and get instant benefits, they ignore the importance of basic skills training in consequence, there are also some impatient students hold the opinion that the basic skills such as dribbling the ball are of no avail. This leads to a stagnant period of basketball training, but also leads to the students' basketball level has been low, Error action during the exercise may result in the danger of students' knee joint injury.^[3]

4.3 The lack of targeted training

When some basketball teachers in colleges and universities are training the students basketball skills, they used to adopt single methods. From the actual situation, each student's physical quality, basketball foundation, and acceptance ability are different, however, some teachers do not take targeted skills training the actual situation of the students, leading to some students being unable to keep up with the training, which also affects the students' enthusiasm for training. And some students can't adapt to the training because of their poor physique, which will even hurt their knee joints.

4.4 The basketball training which is lack standardization

Some basketball teachers are relatively backward in their training ideas, they not only ignore the importance of dribbling technology, but also believe that it will not affect the improvement of basketball level, even though everyone has their training habits. So there is no normative training in the training process, leading to the students' learning of dribbling movement and body postures are not standardized enough, so it is easy to be prone to knee damage.

4.5 The single training content

At present, the professional level of college teachers is relatively poor, and they do not have rich experience in basketball training, so they cannot use their own professional knowledge to train basketball skills. Therefore, Some teachers still need to rely on basketball teaching materials during the training process. Too much attention to the competitiveness and skills of basketball training made them not clear the relationship between basketball training and physical and mental health. At last they ignored the difference between technology and skills. For college students, although it's necessary to master certain sports skills, but the theoretical knowledge and technical practice content is too much for them. Meanwhile, the neglect of the students' comprehensive quality and basic sports ability, and the limit on basketball training time result in the unsatisfactory training effect, even result in the injury of students.^[4]

4.6 Inadequate warm-up exercise

When playing basketball, students need to keep running, jumping, turning, quick stop, sliding and other actions, which can cause frequent knee flexion and extension, so you need to be prepared accordingly. But currently, many students lack the awareness of doing warm-up exercises, the teachers also did not raise higher requirements for the preparation activities, they just let the commissary in charge of sports lead the students to do some simple warm-up exercise. There are no design of warm-up activities for the characteristics of basketball sports, resulting in the students' knee joint is not fully active^[5]. We have investigated the student sports injuries at different stages, and according to the results followed as figure 1, it is obvious that the chance of injury due to insufficient warm-up exercise is still very high:

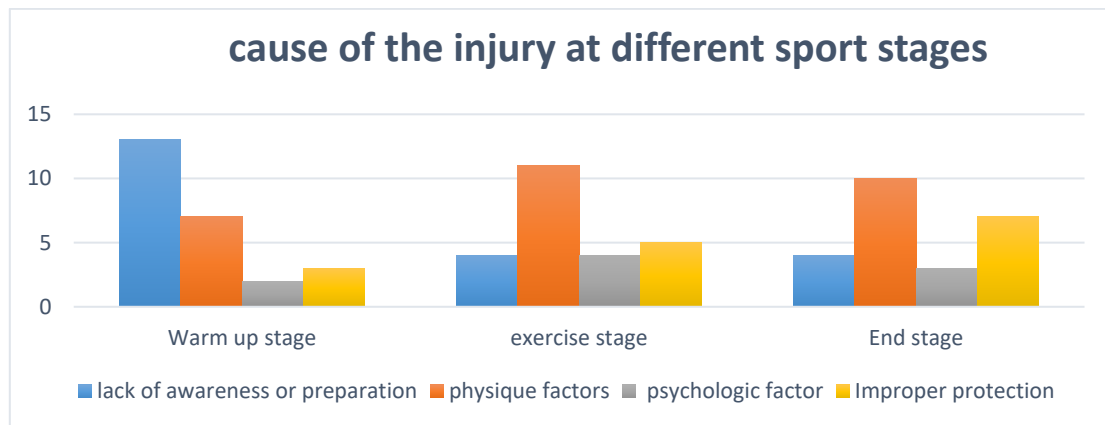


Figure 1. Cause of the injury at different sport stages

4.7 Other factors

There are many other causes of knee injury in college basketball students, such as injured training and competition, poor self-protection awareness, lack of injury awareness, insufficient attention and insufficient medical supervision. We have done a small survey of students' cognition of knee injury treatment, and the results are as follows, According to the results of the survey followed as figure 2, it is clear that more than half of the students know little or even nothing about the damage treatment

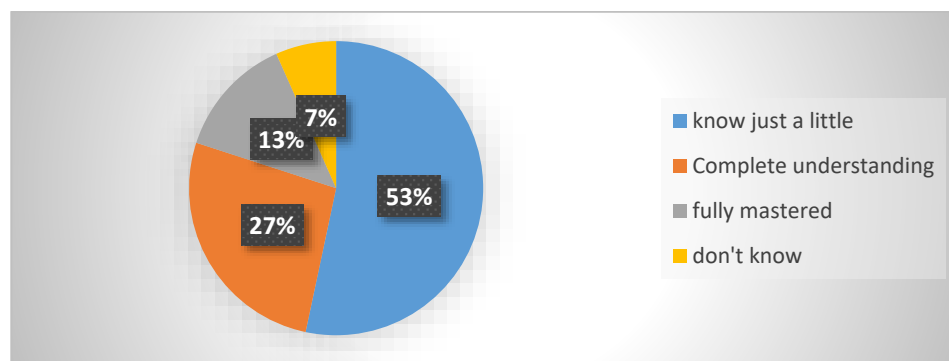


Figure 2. Students' knowledge of the knee injury treatment

5. Prevention strategies of knee joint injury for the students in college basketball courses

5.1 Set up a scientific training concept and formulate scientific training objectives

If colleges and universities want to realize the scientific training of basketball and effectively prevent students' knee injury, they need to establish scientific training concepts and formulate scientific training goals. First of all, colleges and universities need to realize the important role of scientific basketball training and establish a scientific training concept. Colleges and universities also need to realize that the key purpose of conducting basketball training is to improve students' physical quality and promote their healthy physical and mental development, and then to improve students' athletic

level and competitive level. Therefore, colleges and universities need to establish basketball training mainly to improve the health level, to enhance students' health awareness and enhance students' awareness of competition and elite consciousness. In addition, colleges and universities need to develop scientific training goals, namely to enhance students' physique and cultivate students' good quality as the first goal, to students master the basic basketball ability as the second goal, to improve students' basketball level, cultivate students' competition consciousness as the third goal and then they should gradually achieve each goal in training.^[6]

5.2 Step up efforts to propaganda

As a kind of sport, basketball has the characteristics of being more versatile and comprehensive. At the same time, basketball has a great role in promoting metabolism and improving organ function, so universities should give full play to the role of basketball. Colleges and universities need to increase publicity efforts, enhance students' understanding of basketball sports, and make students realize the exercise value of basketball sports, so that more students can take an active part in basketball sports training, and comprehensively improve students' sports level. Secondly, colleges and universities should publicize the knowledge of scientific training and health to enhance students' awareness of self-protection, and they ought to let students pay attention to protect themselves in the process of playing basketball.

5.3 Develop a reasonable training plan

Developing a scientific and reasonable training plan is conducive to improving the quality of training, so teachers should develop a scientific and reasonable training plan before conducting basketball training. First of all, teachers should develop a training plan according to the training objectives and training outline to achieve the training objectives through effective training. Secondly, teachers need to take full consideration to the weather conditions and students' physical quality when making the training plan. First, the coach should make a training plan according to the weather conditions. If there is severe weather such as rain and snow, they can do some indoor training, such as high jumping items can be carried out indoors, and if the weather is good, students can be trained outdoors^[7]. Second, the coach needs to make a training plan according to the students' physical quality, to clarify the training amount and training intensity, to avoid excessive training, causing the students' injury. According to the following figure 3 of the number of student injuries at different stages, we should have a targeted development training plan.

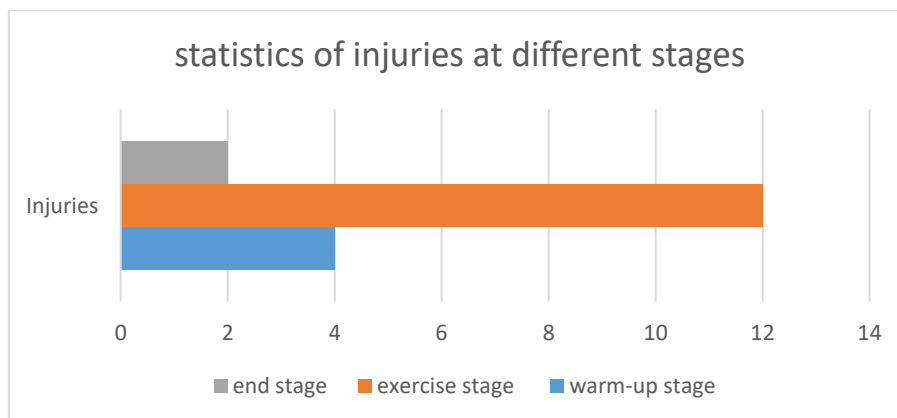


Figure 3. Statistics of injuries at different stages

5.4 Enrich the content of training

Colleges and universities should enrich the training content to stimulate students' interest. Basketball itself is a sport with more training programs, so colleges and universities should fully understand all kinds of basketball sports, and integrate all kinds of training content into the basketball sports training. First, it is necessary to integrate the knowledge of sports culture, sports health care, sports psychology, and other aspects in the training process, at the same time, it's necessary that let students know this knowledge in the process of training, enhance students' awareness of self-protection and injury, clarify the cause and precautions of knee injury in the process of basketball training, and

improve students' level of self-protection. Secondly, basketball has high requirements on strength and speed, so colleges and universities need to carry out more special strength training and speed training in basketball training, so as to improve the absolute and relative strength of students and accelerate the speed of students^[8]. In addition, universities need to add more training programs according to their students' preferences.

5.5 Innovate the training methods

The time of college basketball training is limited, so teachers should innovate the training methods, improve the training efficiency, and then improve the training quality. First, in the training process, teachers need to adhere to the cyclical principle, intuitive principle, differential treatment principle, uninterrupted principle, motivation and incentive principle, general training and the combination of special training and other principles. Second, teachers need to scientifically choose training methods and adopt some more practical training methods, so that students can master the essence of basketball. Third, coaches can learn from other sports training methods, innovate methods of basketball training, and also apply methods in various psychology and other fields in basketball training to optimize the training methods.

5.6 Strengthen the training of basic skills

First of all, increase the hand feeling training efforts. The sense of ball is the perception of the basketball formed by players in the process of learning basketball skills, but also the basic skill that players must master, and the sense of ball will directly affect the dribbling technology of players, so in the training of basketball ball dribbling need to strengthen the training of dribbling feel. When training the sense of the ball, the teacher can lead the students to practice in front of the wall---- let the students stand against the wall, practice holding and dribbling the ball in a certain area. When skilled, students need to look elsewhere rather than watch the ball, And do fast dribbling exercises in a very small area, also requires alternating practice between the left and right hands. You can also lead the students to the body around the ball training, that is, students need to maintain a standing position by putting their feet together, then hold the ball from the ankle began around the ball, and let the ball around the knee and waist, reach the waist and then down, repeat the practice. Second, increase the basic technical training of dribbling, such as high dribble, low dribble and so on. High dribbling is a common method of dribbling, It refers to a way of dribbling while the ball rebound between the height of waist and chest, During training, students need to bend their knees, keep their eyes flat in front and their upper body slightly forward, Then beat the back of the ball with your hand to control the ball drop in front of the side of the body-preferably in front of the waist and abdomen, hands and feet need to be coordinated^[9]. Like high dribbling, low dribbling is a common method of dribbling, referring to dribble when the ball is bouncing at the height of the ball below the knee. During the practice, students need to master the correct posture which is bending the knees, reducing the center of gravity, looking ahead and leaning forward the upper body. Then tap the ball low with the power of the finger and wrist to control the ball. Third, increase the knee joint strength and flexibility training efforts. Basketball has high requirements for students' lower limb strength, so while comprehensively improving students' physical quality, we need to increase the knee joint strength and flexibility training, and actively carry out the balance training of knee joint flexor muscle strength, At the same time, static training is required while the dynamic training, so as to enhance the stability of the joint and avoid joint strain.

However, in the training process, teachers need to enhance the standardization of technical actions, to ensure that students can make each action standard and skilled, to avoid the damage caused by atypical or unskilled actions.

5.7 Carry out reasonable preparation activities

Before conducting basketball training or competition, scientific preparation activities are necessary to ensure that the content, time, and intensity of the preparation activities are appropriate. For example, general preparation activities can be combined with special preparation activities to achieve the effective connection between preparation activities and basketball training, still, it also needs to control the time and intensity of preparation activities.

5.8 Other preventive strategies

First, cultivate students' awareness of self-protection. First of all, in basketball training, teachers need to increase the training of technical action for self-protection, constantly enhance students' self-protection ability, and reduce the chance of knee injury. Secondly, in basketball and games, you can wear knee protection, elbow protection and other protective equipment, so as to reduce the occurrence of injury. Second, attach great importance to sports recovery. Basketball has great physical consumption, so it is necessary to eat high carbohydrates timely after basketball training, so as to keep physical fitness and promote recovery. Recovery can also be promoted by hot compress, massage, and adequate sleep. Third, we should strengthen medical supervision. In basketball training, especially basketball competitions, It's necessary to arrange medical supervision which means that arranges professional medical personnel for the game. Any injury during the competition should be dealt with in time to avoid serious damage^[10]. Fourth, improve the attention to the relaxation practice. Relax exercises can eliminate body fatigue and prevent injury. Therefore, after training or competition, we need to conduct appropriate relaxation exercises, such as slow walking situ, massage leg muscles, etc., which can effectively relieve body fatigue, relax muscles, and reduce the chance of knee injury.

6. Conclusion

Only the scientific basketball sports training can improve the students' level of basketball and reduce the chance of knee injury. Therefore, colleges and universities should clarify the current problems in the basketball training, such as backward training concept, unclear training objectives, and single training content, And to solve these problems, colleges and universities should adopt methods such as formulate a scientific basketball training plan, update the training concept, increase publicity, scientific training objectives, optimize the training content, innovate training methods, so as to improve scientific level of basketball training.

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