Prevention and Intervention of Sports Knee Joint Injury in Adolescents

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Abstract: Knee joint sports injuries occur among young people, are very common and harm the physical and mental health of young people. Must cause the main importance of sports management departments, actively reducing exercise prevention of knee joint injury and intervention measures of research and exploration, to avoid juvenile sports injury of knee occurred or knee injuries to a minimum level, enhance physical and mental health of teenagers.

Keywords: adolescents; sports knee joint; injury; prevention and intervention; study

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1. Preface

The movement of the knee joint injury are common phenomenon in young people to participate in sports, mainly for open or closed injury of the knee joint, to participate in sports training and exercise health of adolescents have caused a bad influence. Sports management should pay great attention to it and take effective measures to reduce the probability of various types of knee joint injuries. It is very important to explore and study the prevention and intervention program of knee injury, which is of great significance to the health of the athletes and the people involved in physical exercises. The project research mainly covers the effective prevention of sports injury and the
influence of various factors in sports, which results in the intervention of the knee injury caused by physical training or physical exercise.

2. Research status of sports knee joint injuries

Sports knee joint injury is one of the inevitable sports injuries for teenagers participating in sports. Great harm to the physical and mental health of young people, and may even affect the happiness of life. By means of literature, investigation and research methods, the author reviewed and published the research results of experts and scholars in the field of knee joint injuries in China and abroad. We systematically understand the root causes of sports knee injuries caused by physical exercise and sports in China, the intervention measures and prognosis. The general law of the knee joint injury caused by the motion has a better method to interfere with the knee joint sports injury. Scientific research should be carried out to evaluate the effect of exercise-induced knee injury on physical and mental health of young people. By evaluating the general situation of knee joint sports injuries, the prevention measures of sports injuries are concluded. To urge government departments pay attention to health problems of adolescent physical and mental, and carried out a nationwide organization of sports injury prevention education activities, as far as possible to reduce the incidence of sports injury.

2.1 Literature method: through the inspection and analysis in recent years, experts and scholars research on the sports injury of the knee joint motion of knee joint injury research and case study, combined with exercise physiology, nutrition, exercise rehabilitation and sports injury and other disciplines theory, continue to carry out the innovation of sports injury of knee the research, summed up the occurrence and movement of knee joint injury and development rules of setting scientific intervention strategies. In the 2008 Beijing Olympic Games athletes caused by sports injury as an example, according to the investigation in October 16, 2008, the official website of International Olympic Committee information learned in the 2008 Beijing Olympic Games athletes were injured in the treatment of over 1055, accounting for 9.6% of the total number of athletes. In Taekwondo competition as an example, the knee joint is the largest part of the incidence of injuries accounted for 52.1% of taekwondo competitions, followed by involving the foot and ankle accounted for 33.6%, third is related to the waist accounted for 28.6%, mainly due to the injured parts of the body with the main points of the game, depends on the characteristics of Taekwondo techniques. It is worth noting that the main characteristics of Taekwondo is a leg known, regardless of which of the jump, rotate and move the knee in squat state. Its heavy load and lack of muscle protection, cross ligament easily lead to overload state, a little careless will cause damage.
2.2 Questionnaire: according to previous research and design questionnaire to normal university Jiangxi Institute of Technology 2015 physical education classes (1) (2) as an example of sports injury situation questionnaire survey of 67 students majoring in physical education, mainly to understand the above two classes of students injury and treatment in in physical training, the statistical results showed that the grade 72 students only 12 students were injured, including 60 students who had suffered injuries, accounted for 83% of the total number of patients with knee joint injury in 9, accounting for 12.5% of the total number. At the same time, we also tested the knowledge about the prevention of sports knee injury. Only 23 students could master the basic prevention knowledge, accounting for 32% of the total number.

2.3 Case study: with the case of sports injury of knee, Jiangxi Science and Technology Normal University Physical Education Students of 2014 grade Chen Jun, female, 26 years old, in 2014 due to the long jump were injured, the hospital was diagnosed as injury of anterior cruciate ligament of knee joint, systematic treatment, after hospital discharge, recurrent knee injuries, start no attention to graduate in 2016 admitted to the Jiangxi science and technology Normal University Physical Education and training master, devoted to the study of knee joint cruciate ligament injury. In November 2016 due to the knee injured again after treatment, Jiangxi Hongdu Hospital of traditional Chinese medicine diagnosis by modern treatment technology again, found the knee joint anterior cruciate ligament rupture, overturned the original diagnosis of anterior cruciate ligament injury results. In March 30, 2017, the anterior cruciate ligament reconstruction was performed in the trauma department of the First Affiliated Hospital of Nanchang University, which caused great harm to the patients both physically and mentally.

3. The structures, types, characteristics, causes and conclusions of knee injuries

3.1 Knee joint injury structure

The knee joint by its structure determines the type of possible injury, the knee consists of femur, tibia and patella, it is the most complex, the largest joint structure and leverage the strongest and the most vulnerable of the knee joint, both sides have ligament reinforcement, to limit the knee valgus or varus. In the knee joint cruciate ligament and meniscus, cruciate ligament and straight characters, located between the femur and the tibia, the main role is to prevent the dislocation of the knee before and after tibial rotation. And the fat pad and the patella. General knee injuries are mostly concentrated in the joint sprain, contusion, muscle injury, bursitis, fracture, dislocation, patella, anterior cruciate ligament, meniscus, medial collateral ligament, lateral collateral ligament and posterior cruciate ligament. The meniscus clamp is between the
femur and the tibial plateau and is subjected to rapid grinding, twisting and tearing. The internal and external collateral ligaments and ligaments are broken or incompletely broken.

The location of injuries in 3.2 knee joints is related to the type of motion. Those who engage in sports are likely to occur in the knee joint sports injury, probably can be divided into jumping knee injury, sports injury of knee and knee injury of Wushu and Taekwondo sports injury of knee and other types of sports injury of knee. The degree of injury varies with different sports types. The following takes Taekwondo, basketball, badminton, alpine skiing as an example:

3.2.1 According to the information about the participation in the 2008 Beijing Olympic Committee Taekwondo athletes injury situation data were informed: the knee injury is the largest proportion of 52.1%, such as knee injury rate of 55.4%, women also accounted for 49.3%.

3.2.2 Institute of Jiangxi science and Technology University 2015 physical education classes of 72 students surveyed, following injury statistics of its movement: knee injuries accounted for 6 and 8.3%, of which 3 accounted for 4.2% of ligament injury; shoulder joint sports injury of 5 ankle injury accounted for 6.9%, 17 accounted for 23.6%; the motion of wrist injury accounted for 11 15.3%.

3.2.3 Consulting professor Liu Jizhi research results of "prevention and rehabilitation of knee joint sports injuries of Chinese alpine skier [1] a paper on China's 16 alpine skier knee injuries were collected, including anterior cruciate ligament injury has 6 people, 2 people have a medial ligament injury with 4 lateral collateral from the type of ligament injury; sports injury of the knee joint sprain which 8 people, 6 people pull, cut 2 people, 6 people 6 people abrasions, contusions of the knee joint injuries; nature can be divided into acute injury of 7 people, 7 people with chronic injury and chronic injury of sharp 4.

3.2.4 The research results of scholars such as Ma Mingfei on "investigation" of knee injury in Beijing city college basketball players of [2] was selected to participate in the 2008 Beijing college basketball game with 200 players as the research object, which has received the 84 college basketball sports injury of male athletes, the knee injured 66 people, accounted for 78.5% among them; ligament injury has 17 people, 13 people 8 people patella injury, cruciate ligament injury, 6 meniscus injury. There were 55 knee injuries in 81 female athletes, accounting for 67.9%. Among them, 10 people were injured by meniscus, 3 were injured by collateral ligament, 2 by cruciate ligament, 0 by patella.

3.2.5 Fan Qiqin wrote the "Fujian province athletes sports injury of the knee joint analysis of" [3] paper, a clear division of jumping sports including high
jump, long jump, triple jump, pole vault three main types, selection of sports team of Fujian province and Longyan city sports school, male 69, female 47, age (10 - 25 a total of 116 years) between jumping athletes. The injury rate of high jump is 35%, the damage rate of long jump sport is 36.6%, and the three long jump sport injury rate is 28.2%, pole vault 25%. The location of knee injury is reduced by patellar strain, cartilage damage, meniscus, cruciate and collateral ligament, and others.

4. Conclusion
By comparing, analyzing and summarizing the situation of knee joint sports injury, it is found that it is related to the technical part of sports events. Different sports techniques have different techniques, and the proportion of sports injuries is different, but the knee joint is an important part of various types of sports injuries. Because the knee joint is a large and complex structure of the joint, it has both strong and stable support function, but also has more activities of flexion and extension. The scope of this activity of strong stability and flexibility, not only is the characteristic structure caused by bone, mainly by muscle, soft tissue around the joint such as the realization of interaction of ligament, meniscus, muscle, fat pad and other auxiliary structures. The two side of knee joint has long lever and less muscle around it, so it is the most vulnerable part of sports injury. It is manifested as severe fracture, dislocation, ligament rupture and meniscus injury, and more injuries such as cartilage, ligament, periosteum and bursa caused by chronic strain. Although the knee joint soft tissue injury is not as urgent or heavy as the bone fracture or the big bleeding, it rarely endangers the life of the patient, but the possibility of it is very big, and it brings great pressure to the teachers and students. If the damage is not caused by us and not enough attention, after proper treatment will make it become a chronic disease, caused by the dysfunction of joint sequelae, and even the formation of irreversible pathological changes and become lifelong disease.

5. Prevention of knee joint sports injury
Strengthening the stability of the knee joint and the training of coordination flexibility are the training contents that can not be ignored in the physical education of colleges and universities. It is an important measure to prevent knee joint injuries. The anatomical weakness of a part of the body and the special requirements of movement techniques have the potential to cause sports injury, but it is by no means inevitable. As long as the direct cause of sports injury is controlled, the scientific teaching and management can keep students in good functional state and avoid bad environment and climate, such injuries can be reduced to a minimum.

As more and more urban residents participate in sports, the corresponding
sports injuries are also increasing significantly. The knee joint, as the most complicated joint in the human body structure, has also become one of the high incidence parts of the sports injury in the process of urban residents sports exercise. In view of this, in order to deepen our understanding of the problem of motion of knee joint injury, reduce the probability of knee joint injury in sports exercise, exercise for knee joint injury treatment mechanism and protection measures are discussed. People take part in physical exercise, in addition to the intrinsic factors of anatomical structure and the motion of the knee joint project characteristics, lack of self-protection knowledge and awareness of self protection, excessive exercise, improper movement or sports venues are not standardized, and the imperfect facilities external factors are mainly caused by the movement of the knee joint injury. Therefore, we should set up sports instructors, guide and popularize safety knowledge and skills, improve sports facilities and so on, so as to provide reference for our national fitness sports health.

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