

Research on Sports Risk Identification and Evaluation of College Students based on Data Mining

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Abstract. The identification and evaluation of college students' sports risk is the premise for college students to participate in sports activities. Understanding the potential risks of college students participating in sports activities is a piece of necessary knowledge for every college student. Based on the data of China Statistical Yearbook in 2017 and the theory of risk management, this paper discusses the influencing factors of college students' sports activities. First of all, the risk is mainly composed of seven factors: personal sports quality, sports knowledge, sports experience, sports attitude, venues and facilities, media communication and sports injury points known by teachers. By using the corresponding analysis methods in data mining, by reflecting the results in the two-dimensional plane, and based on the distance between points, the sport's risk is quantitatively analyzed. For this reason, some suggestions are put forward to reduce the sport's risk of college students and improve their understanding of sports.

Keywords: risk identification; data mining; correspondence analysis; evaluation research.

1. Introduction

Physical education is an indispensable part of the construction of campus culture in colleges and universities. At the same time, it also shoulders the important task of promoting college students' health and cultivating college students' concept of life-long sports. The duality of sports determines that sports bring many benefits to college students, at the same time, it is bound to produce a large number of sports injury accidents that affect the physical and mental health of college students [1]. Chinese scholars Chen Deming, Li Xiaoliang [2] and others found that in recent years, sports injury accidents in colleges and universities have become the primary factor affecting the personal safety of college students employing Analytic Hierarchy Process (AHP). Therefore, it is necessary to carry out risk management on sports safety in colleges and universities from the perspective of risk management, reduce the incidence of sports injury accidents in colleges and universities, and ensure sports safety in colleges and universities. At present, most scholars have done extensive research on college students' sports risk in different fields. Whether from the perspective of medicine, psychology or management, to explore the influencing factors, treatment, and countermeasures of sports risk. However, there is little systematic and operational research on sports risk from the perspective of risk management and sports risk identification of college students. Based on previous studies, this project will learn from the foreign sport's risk management system, and 2017 "China Statistical Yearbook" try to dig deep into college students' sports risk identification and assessment, and make a corresponding analysis of the factors affecting sports safety in physical education teaching. According to the analysis, the identification model and evaluation method of college students' sports risk is established. Through the research, it is helpful to the construction of sports risk models and related data collection, reduce the risks and injuries in sports teaching, improve students' ability to identify and evaluate sports risks, and help schools to control the risks existing in sports activities [3].

2. Definition of Sports Risk and its Causes

2.1 Definition of a Sports Risk

In recent years, with the increasing number of risk events in sports, people pay more and more attention to the factors that affect the occurrence of sports risk. Chen Shaping and other experts [4] define sports risk as to the physical and mental injuries and adverse consequences caused to individuals by participating in physical exercise. Liu Xiaojun, a Chinese scholar, believes that the definition of sports risk can be divided into two kinds, which can be divided into broad sense and narrow sense. the broad sense of sports risk refers to the uncertainty that exercise brings to people's health, survival and development. In a narrow sense, sports risk refers to the uncertainty that people suffer losses in sports or related activities. Sports risk events can cause mechanical, material and spiritual losses [5]. The author believes that sports risk refers to the physical, material and spiritual accidental injuries suffered by sports participants in different forms of sports, including sports risks in the sense of human nature and social nature.

2.2 The Causes of a Sports Risk

Many scholars in our country have analyzed the causes of sports risk. A survey of 58 universities across the country shows that more than 80% of universities have students injured in sports. [6] the highest sports injuries occur in extracurricular sports (45.4%), followed by competition (25.7%) and teaching (21.4%) [7]. Lin Yanrong [8] A questionnaire survey of 2231 college students from the perspective of the PE classroom found that only 47.2% of the teachers could personally lead the students to do warm-up activities in each class, and only 11.2% of the teachers did relaxation activities. Only 29.8% of teachers can comprehensively supervise students' exercises. Hou Baichen et al. [9] according to a questionnaire survey of 538 sports students, the main causes of students' sports injuries are insufficient preparatory activities (70.19%), incorrect sports skills (61.89%) and too difficult sports (55.47%). Among the various types of sports injury risk factors investigated, teachers and coaches more or less have a certain responsibility relationship, among which the greater responsibility factors are: vague sports concept, lack of protection and sports difficulties, accounting for 70.31%, 61.11%, 59.82%.

3. Research on Sports Risk Identification and Evaluation of College Students

Risk identification is the process of judging, classifying and identifying the risks faced by risk subjects and potential risks [10]. Risk identification in sports activities refers to the identification, confirmation, and classification of various potential risk factors and possible risk events before the occurrence of risks, which is the first step of risk management. the purpose is to produce a rational cognition of the risk sources, distribution, causes, associations and consequences of sports activities [11]. Risk identification is the perception or understanding of personal objective risk and subjective risk, and it is the intuitive judgment and subjective feeling of participants to all kinds of potential objective risks in different sports activities. The difference between college students' subjective cognition and evaluation of potential dangers in sports and objective risks will lead to incorrect sports behavior, which will lead to sports injuries. According to the analysis of the actual investigation results, the main factors affecting college students' sports risk identification are individual internal factors, external environmental factors and sports factors [12]. College students' identification of sports risk is caused by individual internal factors (physical quality, sports knowledge, sports experience, sports attitude, etc.). External factors (venues and facilities, media and sporting events) [13].

3.1 Individual Factors

3.1.1 Individual Internal Factors

Individual factors should include college students' physique, health status, functional status, adaptability to exercise, exercise habits, sports psychological status, sports health care knowledge,

etc. [14]. On the one hand, due to the differences in gender, physical quality and sports level of each college student, it is bound to have varying degrees of impact on college students' risk perception of sports activities. On the other hand, college students blindly carry out sports activities when they have insufficient understanding of their diseases, injuries, poor physical condition, and poor physique.

3.1.2 Individual External Cause

There is an obvious difference between the life mode of a university campus and that of the middle school campus [15]. Universities have relatively low requirements for physical education and morning exercises, and students have more time to arrange their study and life. In this case, students with weak self-control are more likely to choose a more comfortable lifestyle and reduce the number of physical exercises; with the increase of grade, these changes will become more obvious. The decrease of time to participate in physical exercise may lead to a decrease in the body's adaptability, an increase in the inertia of the visceral system during exercise, a decrease in the ability of nerve control of skeletal muscle and an increase in working hours, so it is difficult to obtain the best sports performance. This not only leads to the decline of students' exercise ability but also leads to an increase in the incidence of sports diseases.

3.1.3 Reserve of Sports Knowledge

Siegrist et al. (2000) show that in the absence of knowledge, the superficial judgment and benefits of risks may be based on the assessment responsible for dealing with hazards or activities [16]. It is conceivable that without sports knowledge, most college students will not be able to directly estimate the correlation between risk and technology. On the contrary, college students need to rely on teachers and coaches to provide professional guidance. Sj ö bergL et al. (1991) found that the tendency of knowledge is negatively correlated with the level of risk perception and risk. There is also a negative correlation between risk perception and the influence of knowledge [17]. Mastering the necessary sports knowledge can effectively reduce the occurrence of sports risks. Lack of necessary sports knowledge, unable to understand the risk points of sports, college students are also unable to predict the risks, thus greatly increasing the possibility of sports risk. Knowledge tendency is also negatively correlated with risk perception and risk level. College students' sports knowledge includes sports environment, sports activity plan, sports characteristics, and vulnerable parts and so on. Sports risk knowledge should also include college students' understanding of sports risk knowledge and risk knowledge related to sports events. Whether there are developmental risks in the body, whether the age is too young and genetic and other basic conditions), only if we fully understand the law of sports development and master the basic sports skills, we are more likely to avoid sports injuries in the process of sports training.

3.1.4 Experience in Sports

Experience has been identified as a factor affecting people's risk perception, and lack of experience is an important reason for the occurrence of a risk. However, some studies believe that experience is inversely proportional to the level of risk perception (Alhakami, Slovic, 1994) [18]. When people have too much experience of persistently high risk, they will consider the existence of these risks less. In sports teaching activities, if college students are very strange to the actual situation of a certain sport or mistakenly think that they have a high degree of mastery, it will easily lead to risks. At present, when students choose a course or participate in a sport, they usually use their existing experience to judge the risk factors of the sport. However, when people rely too much on experience, they will consider these risks less, which can be proved by the probability of drowning. Therefore, the correct evaluation of existing sports experience, reasonable use of sports experience is also very important.

3.1.5 Attitude towards Sports

Attitude is associated with physical or physical tendencies to approach or avoid something. At present, theorists usually define attitude as the evaluation of people's positive or negative views, emotional feelings and the tendency to something or concept. College students' sports attitude refers

to their acceptance of the sports they want to engage in, as well as their overall impression of sports. Arrow (1965) divides people's attitudes towards risk into three categories: risk evaders; risk enthusiasts; risk neutrals. In the process of sports, some college students pursue excitement and prefer high-risk sports, while others do not like to take risks and try to avoid taking risks or participate in low-risk sports, and even some students like to be in the middle. participate in sports risks that can control and maintain a neutral attitude, which is closely related to the participants' personality and existing sports experience [19].

3.2 External Factors

3.2.1 Sports Venues and Facilities

Sports venues and facilities are carriers for students to participate in sports activities. The quality of venues and facilities is directly related to the health and safety of students. There are hidden dangers in the initial design of sports facilities in many schools in our country. Due to the small size of the site, many equipment and sites are relatively dense. For example, there are table tennis tables in the runway buffer zone, or the fence is too close to the runway, resulting in many sports hidden dangers; besides, many school sports equipment can no longer be repaired and sports facilities are not regularly maintained or overhauled, or there are hidden dangers to safety due to incorrect maintenance of venues and facilities. In this case, whether college students can make a basic assessment based on experience or intuitive impression to judge the degree of damage to the site,

3.2.2 The Impact of Media Communication

Mass communication and cultural language affect the public's social acceptance of modern science and technology and the formation of risk awareness. According to Lerbinger, the degree of media attention to risk is an important factor affecting public risk perception [21], and the selectivity of the media and other institutions to pose a risk emphasizes the social motivation for the formation of risk awareness. People openly discuss the consequences of a risk society in the media, so that the audience can learn some lessons from it and help explain the experience. Most audiences construct their subjective risk cognition through media or interpersonal risk information dissemination, sports risk has a strong knowledge dependence, only when the risk occurs, or with the help of media reports, sports participants can know the danger [22]. Today, with the highly developed Internet, college students' risk cognition constructs their subjective cognition through the dissemination of media or interpersonal risk information. If the media reports and analyzes a major sports accident in detail, students will understand the risks of the sport. The media's statement form, description method, communication frequency and authenticity of sports risk will affect the formation and change of college students' concept of sports risk. Only through media reports can college students know its risk and learn the inducement and prevention of injury from the analysis of the media.

3.2.3 Teacher Guidance and Training

Physical education teachers are the organizers of physical education class and the implementers of teaching content, and they are directly responsible for the safety of middle school students in the classroom. Most sports injury accidents are directly or indirectly related to PE teachers. The main forms of sports injury accidents caused by PE teachers are as follows: the training burden of teaching content is beyond the normal bearing capacity of students. Teachers themselves have defects in organizing teaching. Students' safety education is not timely. Ignore the differential treatment of students with special physique and medical assistance and notification is not timely [24]. Therefore, PE teachers should make PE teaching plan scientifically and reasonably according to the characteristics of students, attach importance to the preparation links of PE teaching, arrange a load of sports reasonably, and do a good job of safety protection in the process of teaching. At the same time, risk management mechanism is introduced into teaching to change sports injury from passive to active management, to reduce the risk in physical education [25].

4. Model Building and Data Collection

After analyzing the internal and external factors affecting the individual, it is based on the data of college students all over the country. This paper obtains the sports risk data of college students from the China Statistical Yearbook. To quantitatively analyze the role of these relationships, the correspondence analysis model is adopted in this paper. Correspondence analysis, also known as correlation analysis and R-Q factor analysis, is a newly developed statistical analysis technique of multivariate dependent variables in recent years, which reveals the relationship between variables by analyzing the interactive summary table composed of qualitative variables [26].

5. Results and Result Analysis

Based on the SPSS24.0 platform, the collected data is calculated as shown in Table 1, and the result is shown in Fig.1.

Table 1. Statistic data

Internal cause	External cause		
	Venue facilities	Media Communication	Teacher Guide
Differences in physical fitness	10	5	5
Sports knowledge	3	10	7
Sports experience	6	10	4
Athletic attitude	4	10	6

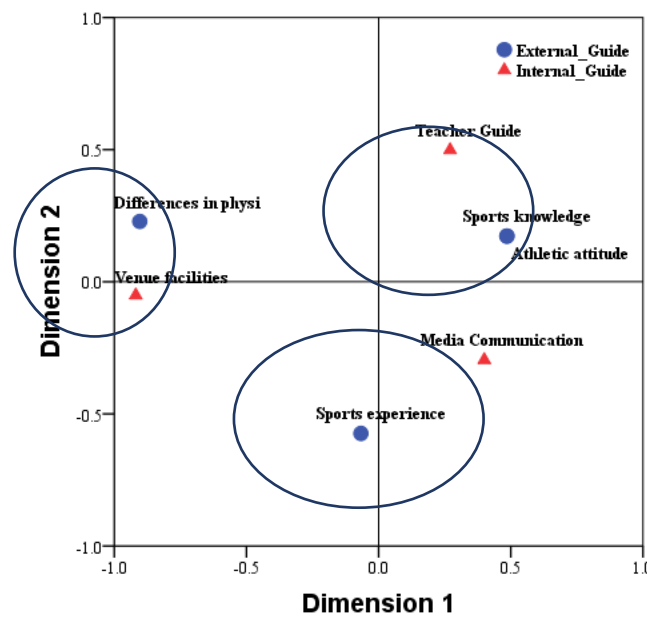


Fig. 1 corresponding analysis results

As can be seen from Fig. 1, it is roughly divided into three areas: among them, teachers' guidance to students is mainly reflected in sports knowledge and attitude to prevent risks. Students' sports experience often comes from the influence of the media. Different training environments and facilities often affect students' poor physical fitness. According to the results, this paper gives some suggestions as follows: enhance the training environment, strengthen the influence of the media and increase teachers' supervision over students, to reduce sports risk and strengthen sports experience. improve sports attitude and reduce the physical differentiation of college students.

6. Conclusion

From the perspective of physical education in colleges and universities, students master certain cognitive knowledge of sports style and sports risk identification methods, evaluate the risk number of selected courses, select courses, and training with a purpose, to avoid the occurrence of risks. Teachers and management can also through the assessment of project risk, select and improve teachers' teaching methods, guide students' learning, and extracurricular exercise so that sports risk management runs through the whole sports activities of the school. Therefore, the research on how to improve college students' identification of sports risk and correctly evaluate sports risk has certain reference value for decision-makers and participants.

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