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Physical Training Risk Management Based on Big Data Analysis Technology

Chen Wang* and Lipeng Zhang

Nanchang Institute of Science and Technology, Jiangxi 330108, China

wangchen9202@163.com

**corresponding author*

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Abstract: In recent years, big data analysis has received extensive attention in the field of education. It can be said that using sports big data system for sports research will play a more important role in scientifically analyzing the physical and technical characteristics of elite athletes, selecting high-quality athletes, improving the mobility of physical technology, building and optimizing the management of modern sports science. According to the scientific and operable characteristics of big data collection, a large number of random and sampling data collected in the past have been changed to make it more accurate and reliable. The main research methods of this paper are: literature reference, AHP and investigation methods. This paper uses big data to analyze and study sports, and then establishes a simulation system. Firstly, the AHP method is used to analyze the model, and then the data is used to modify the model to improve the accuracy of system simulation. The experimental results show that AHP not only improves the analysis efficiency by 23%, but also reduces the probability of error. The last part expounds the influence of big data analysis technology on the research of physical exercise risk management by comparing the advantages of big data application in physical exercise risk management.

1. Introduction

Both sports school training and university education should strengthen and pay attention to physical training, comprehensively improve the quality of training and teaching, speed up the transformation of physical energy under the new situation, and ensure the smooth completion of training [1]. Physical exercise is not only the core content of training and education, but also the indispensable core content of cultivating high-quality talents to meet the needs of the complex and changeable information age [2-3]. Physical exercise should not only achieve high difficulty and

high difficulty, but also effectively improve the quality and level of training. Physical exercise can effectively improve the physical quality of all students and effectively reduce various injuries [4-5]. On this basis, firmly establish the concept of actual combat traction training, improve students' endurance, adhere to hard and rigorous training, and constantly adapt and organically adapt to the objective changes of physical requirements in the transition period. Reducing educational risk is a direct way to effectively promote the development of Sports Science [6-7].

This is a method to evaluate complex stakeholders, which is used to solve the basic problems of interest analysis [8]. Based on the principle of creating common value, the inventor of this method proposed a systematic framework to represent the whole risk management process. According to his system framework steps, stakeholders will integrate their resources and capabilities, so that analytic hierarchy process of innovation can be developed [9-10]. In order to evaluate this research framework, this study collected a large amount of data. This case represents the importance of big data analysis technology for physical exercise risk management research and system implementation [11-12]. Because the data in the study does not change much, the results are generally unconvincing.

Based on AHP, investigation method and literature reference, this paper realizes some innovation. Using big data method to study physical exercise risk management is mainly to evaluate the application of big data analysis method in physical exercise risk management through the risk matrix of AHP. Then the mathematical calculation model is established through relevant methods to lay a good foundation for the analysis of physical exercise risk management under the big data technology.

2. Physical Training Risk Management Analysis Method Based on Big Data Analysis Technology

This paper mainly uses the methods of literature comparison, AHP analytic hierarchy process and field investigation. Based on the careful study of relevant theoretical literature and academic achievements, this paper studies the field research model, finds out the existing problems, and puts forward improvement suggestions and measures. Finally, combined with examples to highlight the arguments of this paper.

2.1. Research Literature

The method of studying literature is to understand and interpret the relevant information of literature in a scientific way. In sorting out relevant theoretical knowledge and examples, we need to find a large number of references. The ways to query references are: through the school library, you can query books and electronic resources, and you can also buy books. In addition, you can also query relevant materials through the Internet, so as to facilitate us to correctly and fully understand the relevant information of physical exercise risk management in a large amount of data.

After determining the task, with the help of relevant websites and mobile phones, the relevant theories on physical exercise risk management have played a theoretical supporting role for later writing and facilitated further research. This is a very important learning method.

2.2. Analytic hierarchy process

AHP contains quantitative and quality testing. This method is an understanding method from foundation to complexity. It can dissect complex problems into simple problems and solve

problems from the root of things. According to each small part, it is analyzed and processed by mathematical method, and its importance is transformed, so as to find the best scheme.

First, classify the weights, and the following formula should be used:

$$Q_A = \gamma_{\max} A \tag{1}$$

EI represents the random sequence of the matrix; M represents the general sequence index.

$$EI = (\gamma_{\max} - M)/(M - 1) \tag{2}$$

1 represents the standard random index. The reason why AHP is adopted is that it will not discriminate against research objects. All research objects can be studied and analyzed under one platform. It is one of the more important and useful decision-making systems and analysis and prediction tools. After its mechanism research, analysis and demonstration and comprehensive statistical prediction analysis, the important principle of this thinking system is to try not to excessively separate the potential influence of different factors on the analysis results. In AHP decision-making, the final result of factor weight and adjustment method at each decision-making level will directly affect or may indirectly affect the result. The comprehensive influence degree of different influencing factors on the evaluation results is relatively quantitative and consistent, which is very obvious. This research method can be especially suitable for the multi-system evaluation method of unstructured characteristic data and the multi-objective and multi-level system evaluation. This method not only follows higher mathematics, but also does not unilaterally focus on behavior, logic and argument. On the contrary, it can combine organic quality methods with fixed imitation methods, decompose them into complex mathematical systems, and gradually transform people's abstract mechanical thinking process into mathematics. In the process of transforming to multi-level single objective problem, systematization problem can be regarded as a comprehensive decision-making problem with multi-objective, multi criteria and difficult to be fully quantified, which is easy to accept. Through group comparison and calculation, a quantitative corresponding relationship between the number of all elements at the same level and the number of elements in the previous and subsequent levels is determined. Finally, a simple and intuitive mathematical operation can be carried out. The calculation is simple and the result is simple and clear, which is convenient for decision-makers to understand and master.

2.3. Investigation and Research Method

The research method of investigation data refers to the method that researchers understand the relevant objective things through observation, investigation and comprehensive analysis, understand these information materials, and directly and systematically obtain the research results of relevant facts and data. This paper collates, compares, analyzes and summarizes the collected data, and obtains the differences and reasons between the traditional model and big data technology through a large number of data and actual cases.

3. Physical Training Risk Management Experiment Based an Big Data Analysis Technology

3.1. Experimental Design

Risk response is the key link to specific methods and tools for risk assessment and management of the situation. Scientific response measures are an important part of leading scientific training. Big data has fast data management functions, can use the data in the database for research and analysis, and can solve potential risks in military training, guide training to avoid or reduce risks, and provide specific methods.

First, introduce the 10mx5 exercise technology and steps to the testers; then carry out a period of experience and training; then perform a 10mx5 cycle test on the tested personnel (according to the 2008 PLA physical training and assessment summary, according to regulations, in an environment under 25 years old) Run back and forth, the default value is 27 seconds), the final test results are statistical results and a summary of common problems in the experiment.

3.2. Experimental Data Collection

The subjects of this experiment are 31 college students aged 21-24. First, collect their basic physiological indicators. The data sheet shows that their height, weight, blood pressure and heart rate are normal and healthy. Divide them into two groups with 8 people in each group. The two groups are divided into experimental group and control group. The experimental group chose physical exercise risk management, and the control group adopted traditional methods. A total of three tests were performed. Take the average, standard deviation, error rate and injury rate of each group.

Table 1. Data table of physical training experiment

	Average	Standard deviation	Error rate	Injury rate
Test group	88	0.12	5%	2%
Control group	76	0.22	5%	14%

It can be seen from table 1 that the experimental group with physical exercise risk management is 12 points higher than the control group. At the same time, the standard deviation is more representative. The most important thing is the injury rate of the experimental group. The injury rate was 12% lower than that in the control group. In order to better understand the relationship between the data of the experimental group and the data of the control group, we analyzed Table 1, and the analysis results are shown in Figure 1:

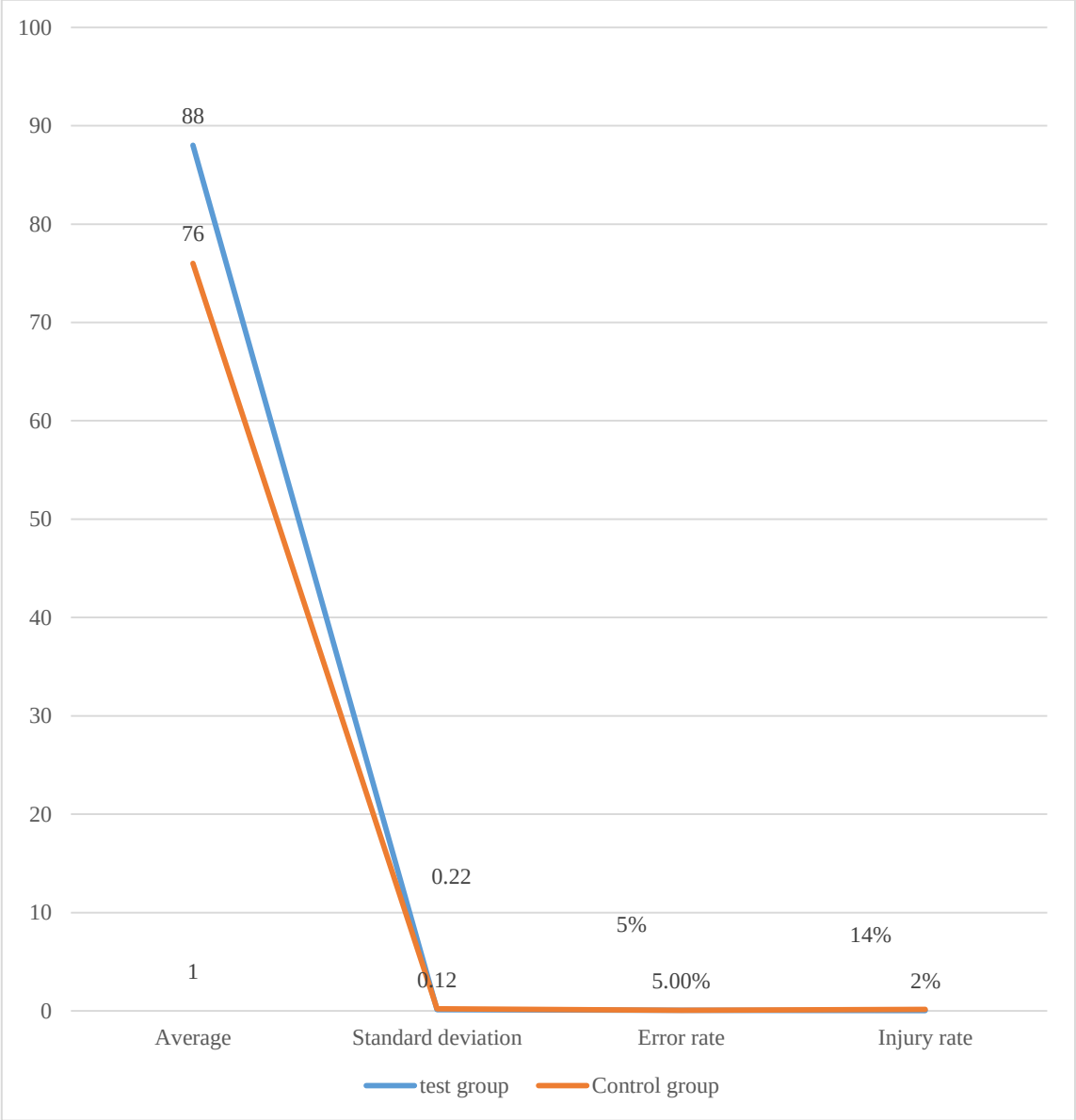


Figure 1. Data analysis diagram of physical training experiment

As can be seen from Figure 1, the training after using physical training risk management significantly reduces the injury rate and improves the scoring rate of the team. These are big data based analysis techniques. Through big data analysis, understand the importance of physical exercise risk management to physical exercise.

4. Physical Training Risk Management Analysis Methods Based on Big Data Analysis Technology

4.1. Advantages of Big Data in the Application of Training Risk Management

Previous sports risk management surveys used questionnaires to obtain information about sports risks and determine their limitations. In the information age, various advanced technologies emerge

in endlessly. Therefore, the use of research ideas that combine big information technology and risk management theory to conduct sports risk management research can improve the scientific nature of sports, reduce sports risks, and prevent and respond to risks.

People recognize the benefits of big data in other fields. They can replace traditional questionnaires, interviews, observations and other traditional methods of collecting information in risk management research in sports training. It has many information storage and processing functions, thereby eliminating past samples the limitations of the investigation, and reached a more realistic conclusion, structured data and unstructured data, thus enriching the data information processing capabilities, it also has the ability to process data at a high speed, and can Return information quickly.

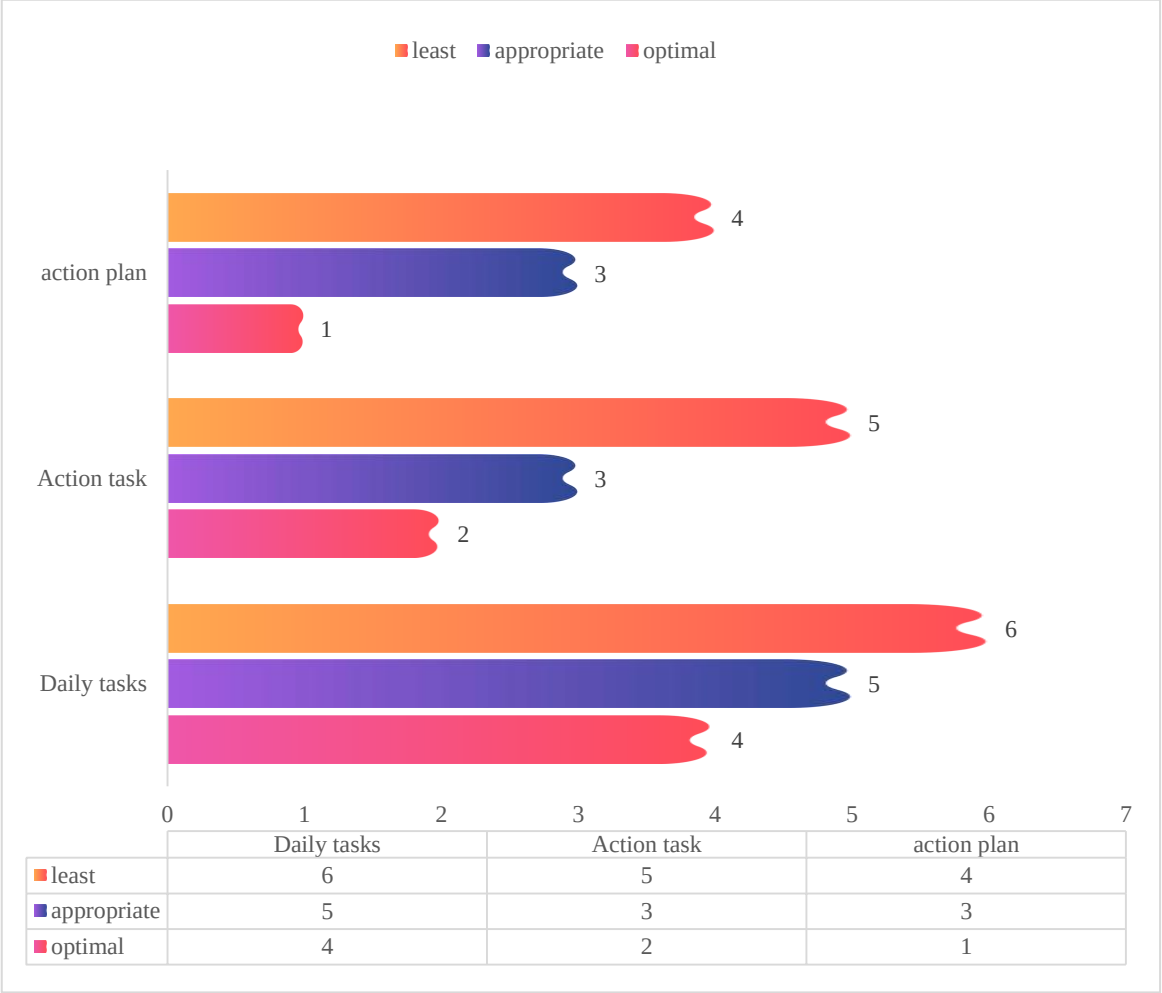
4.2. Use Risk Matrix to Analyze Risk Factors

Performing physical tasks can usually be divided into several parts: going to the exercise site, moving back and forth to the starting point and completing the goal. In order to ensure the safety of this sport, it should be understood that risk identification, physical examination, assessment and testing are mainly carried out through mathematical risk assessment procedures. The main point is to divide the risks from 1 to 5 into five levels, 5 of which are the biggest risks. In different training tasks, the risk factors to be evaluated are not the same. Therefore, in the design stage of this article, the task of risk management is to effectively identify risks, and the plan itself has risks. A good physical exercise program can usually improve exercise safety, while a bad physical exercise program can lead to failure. To this end, this article carries out a risk assessment of different types of sports mission plans according to the "O-PORD Guidelines and Action Plans" (OPLAN Guidelines), and requires the guidelines to provide the best time for issuing different types of sports mission plans.

Table 2. Time factor risk evaluation data table of exercise task planning

	Optimal	Appropriate	Least
Daily tasks	4	5	6
Action task	2	3	5
Action plan	1	3	4

Table 2 shows that if the exercise task can be notified to the coach 3 days in advance, the danger level is 2, and if the daily regulations are issued within a few minutes before the danger level is 5, the danger level is 5. In order to better see the relationship between Daily tasks, Action tasks and action plan, the data is analyzed, and the analysis results are shown in Figure 2:



	Daily tasks	Action task	action plan
least	6	5	4
appropriate	5	3	3
optimal	4	2	1

Figure 2. Data analysis diagram of risk assessment of time factors in exercise task planning

Figure 2 shows that when the same type of physical exercise task is managed and controlled by different types of organizations, the risk control level of the physical task includes risk. For joint risk prevention tasks led and controlled by community sports coaches, the risk level can be defined as 3.

5. Conclusion

According to the relevant research of this paper, although some progress has been made, there are still deficiencies on the whole. Big data has a lot of in-depth content in the research methods of physical exercise risk management. Due to reasons such as space and personal ability, many steps in the decision-making process have not been involved. In addition, the practical application effect of the improved algorithm can only be compared with the traditional model from two aspects of theory and simulation.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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