

Research on Evaluation Index and Index System of Athletes' Physical Fitness Training Based on Data Mining

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Abstract: With the development of modern sports, the requirement for the comprehensive quality of athletes is getting higher and higher. According to the characteristics of sports, the level of athletes and the tasks of different training stages, the training proportion of the two is reasonably arranged, and the physical training and technical and tactical training are effectively combined. Therefore, in the process of training and training athletes, countries strive to standardize, scientific and innovative. On the basis of defining the concept of physical fitness training, this paper expounds the main composition of athletes' physical fitness level. Data mining is the process of extracting valuable knowledge from a large amount of data by using machine learning method. The athletes' sports training assisted decision support system constructed by data mining technology realizes the organic integration of different aspects of athletes, applies scientific training theory and advanced training methods to sports training management, and studies the athlete's special physical ability from the perspective of evaluation, to conduct a deep theoretical analysis of the athlete's special physical fitness characteristics, and build an athlete's special physical fitness evaluation index system.

1. Introduction

Physical fitness level is the technical and tactical basis of sports and the material basis of team technical style, fighting style and mental outlook [1]. For competitive sports, the ultimate goal of sports training is to create excellent sports results, and athletes' physical fitness is the most basic and controllable factor to improve competitive ability. Physical fitness training highlights the overload adaptation training for various organs and functional systems of the human body, aiming at generating physical fitness and psychological adaptation, so as to achieve the purpose of excavator's potential, improving overall athletic ability and cultivating tenacious fighting spirit [2]. Physical fitness test is the basic way for coaches to understand athletes' physical fitness. Data mining can provide decision makers with important and valuable information or knowledge, thus producing incalculable benefits. It is gradually becoming a magic weapon to be in an invincible position in the market competition [3]. Establish database and computer evaluation system, establish physical fitness training evaluation index, the athlete's score after the test can directly reflect this level, making the scores of multiple items comparable, greatly strengthening the coach's control of the athlete's ability, and facilitating the coach. Material selection. Scientific training theory and advanced training methods have become a possibility to apply to athletes' sports training management. Data mining technology is theoretically feasible in athletes' sports training assistant decision support system [4].

Athletes' physical ability is mainly composed of special speed, overall strength, sports endurance and psychological function. Physical fitness in competitive sports refers to the ability of athletes to mobilize organs and systems of organisms to overcome fatigue and complete special training and competition with high quality under special training and competition load [5]. In the aspect of body shape, while continuing the study of athletes' external body shape, the study of content shape will be increased, and the study of body shape will focus on its depth direction: in the aspect of body function, it will be more closely combined with the establishment of sports function monitoring and evaluation index system [6]. The coaches should regularly perform physical fitness tests on the athletes, calculate the performance of each athlete's physical fitness test according to different test

standards, and then evaluate the athlete's physical fitness status according to their own experience, and formulate corresponding training programs to guide the training. There is a lot of important information hidden behind the surge of data, and people hope to be able to analyze it at a higher level in order to make better use of this data [7]. To provide decision makers with a unified global perspective, data warehouses have been established in many areas. Through various trainings, athletes can better master basic skills and tactics. Therefore, due to the faster pace of contemporary competitions, the transformation of attack and defense is more flexible, the offensive is fierce, the defense is fierce, and the confrontation is fierce, so the athletes' physical quality and skills and tactics have higher requirements [8].

2. The Theory of Athlete Physical Training

The functional level of the body is the basic link of the physical structure. The functional level and state promote and restrict the physical exertion. Physical fitness is the concentrated embodiment of physical fitness, and also an important index reflecting the physical level. The speed of sports has the special characteristics of strain (direction change, speed change), rhythm and abruptness. Athletes' physical fitness must meet the requirements of fast attack and defense in order to ensure the full play of skills and tactics. Play the best level of competition. The traditional method relies on the coach's experience to adjust the athlete's physical fitness to the best through adjustment and intensive training during the preparations. In the modern and fiercely competitive sports competitions, it is often necessary to carry out arduous confrontation in the case of adversity under the circumstances of backwardness. At this time, the psychological function and the will quality of athletes often become the key factors for winning. It is essential for the education of athletes. Education can not only develop the IQ and emotional intelligence of athletes, but also better understand the training tasks and tactical arrangements of coaches. It also makes them clearly aware of their own deficiencies and how to make up for the shortfall. Reasonable arrangement of training tasks, training content and exercise load in each stage. Physical fitness training should follow the practice of training Period every year.

The construction of athlete training index system cannot be separated from the support of theory. No matter what form of index construction, first of all, there must be corresponding theory to support the formation of the index. Secondly, it needs corresponding practice to detect and evaluate the practicability of the index. Physical training pays attention to the improvement of a certain sport quality. It should pay enough attention to the athletes' overall sport ability, confrontation ability, long-term and high-intensity anti-fatigue ability, as well as the psychological quality of struggling upward. The means and methods of physical training are dazzling, but we should clearly realize that speed is the most direct reflection of physical fitness level, speed is the soul of athletes, and speed is the prerequisite and condition for victory. Under data mining, the analysis of coaches for athlete management, sports performance conversion, historical data management, etc., to improve the efficiency of data processing. However, the scientific evaluation and prediction of the state of physical fitness cannot be solved, and the knowledge hidden behind the data resources cannot be found. The more important information hidden behind these data is a description of the overall characteristics of the data and predictions of its development trends, which have important reference value in the decision making process.

Functional state can also have a corresponding impact on morphological structure, both of which are interdependent and mutually restrictive. Sports quality refers to the various abilities of athletes' body in sports. Usually includes strength, speed, endurance and flexibility, while strength, speed, endurance and flexibility and other sports qualities. According to the model provided by the model base system, the data mining module carries out data mining on the multi-dimensional data set in the data warehouse in order to obtain the required knowledge. In order to improve special physical fitness and adapt body shape to special requirements, training means and methods closely related to special sports are adopted. Only by deeply understanding the development characteristics of contemporary sports can we correctly grasp the special content of sports special physical fitness, so as to accurately select and apply the methods and means of special physical fitness training.

Physical fitness test indicators have quantitative criteria, can use these data to analyze the changes in athletes' physical state and evaluate their physical status. Sports quality is actually an external manifestation of athletes' physical fitness level. The level of sports quality depends on the level of functional ability of human organs and systems. Therefore, physical fitness and sports quality are closely related.

Sports behavior needs to be realized by human movement. In the process of sports, human body should follow certain rules of movement, follow the rules of the formation of sports skills, follow the principles of gradual, from shallow to deep, from easy to difficult, and reasonable load. The training of sports quality should be brought into the track of improving the overall sports ability, and the training of sports quality should be raised to a high level of comprehensive consideration and understanding of physical training. Through these historical data, it is possible to analyze the development and change laws of athletes' physical state, predict the physical state of athletes in a certain period, and provide scientific basis for coaches to formulate training plans. To achieve the effect of improving the level of special physical fitness and special sports. The athlete's special physical training is mainly carried out in combination with the technical and tactical training of the sports. The specific training methods and means include: freehand practice, and comprehensive and cyclical exercises. The physical structure of athletes as a system, its shape, function and sports quality are in a specific position, contributing their own functions. Each ability has its own specific components, each of which is determined by a specific form, content or function, which in turn forms the hierarchy of the athlete's physical structure.

3. Research on the Evaluation Index and Index System of Athletes' physical Fitness Training

The theory and principle of combining physical training with special technical and tactical training. Athletes' strength, speed and endurance training is the basic physical training of sports. The construction of athletes' training system indicators should follow the basic principles formulated scientifically and reasonably on the basis of respecting objective laws, which are of universal, guiding and constructive significance. In the process of training, coaches can evaluate each athlete's physical condition by carefully analyzing the data of athlete's physical fitness test. Coaches usually extract Athletes' physical fitness status according to test data. Therefore, only useful data for decision support are extracted from the operation environment and input into the data warehouse when data mining is carried out by each user. The mode training is based on the current situation of the athletes, and the model characteristics of the best state of the elite athletes are established. Various training control models are established, and the training is carried out in a planned and step-by-step manner according to the model. However, to establish a training model, it is first necessary to determine the indicators contained in the model and to scientifically evaluate the indicators of the athletes concerned, and then determine the training objectives.

The basic purpose of evaluating athletes' special physical fitness is to master the athletes' special physical fitness level effectively, accurately, systematically and timely. If in the process of training, in order to achieve outstanding results, the training volume is blindly striving for greater strength and the principle of kinematics is not obeyed, the athletes may be irreversibly injured, so as to lose their career. Therefore, in the process of constructing the index system, we should follow the kinematics principle and construct a scientific and reasonable training mode and evaluation index. The selection of test attributes and how to divide the sample set are the key links in the construction of decision tree. The test attributes are obtained from the experience of sports experts. According to the purpose, requirement, object and training level of Athletes' physical fitness evaluation, the first level index is determined, and then the second level index is determined. The evaluation content and index system of athletes' physical fitness level should be composed of first-level indicators and second-level indicators. The key to solving the optimization problem of athletes' physical fitness indicators is to find out the relationship between each indicator item. In the knowledge model of data mining, the association rule pattern is an important one. There may be different degrees of correlation between indicators, resulting in "data dimension scourge", which directly leads to inefficiency and even failure of data mining tasks. The principal component analysis method can

solve one of the effective methods for reducing the dimension of the index attribute. The evaluation indicators of athletes' physical fitness training are shown in Table 1.

Table 1 Evaluation Index of Athletes' physical Fitness Training

First level index	Two level index	Weight
Body shape	Length	0.03
	Circumference	0.05
Sports quality	body composition	0.30
	Speed quality	0.27
	Strength quality	0.18
	Bouncing ability	0.22
	Endurance quality	0.31
	Sensitive quality	0.27
Physiological function	Cardiopulmonary function	0.19
	Motor function	0.33

Sports endurance in physical training mainly refers to the ability to engage in special activities with high intensity for a long time. Athletes' endurance quality is mainly in the form of glycolysis energy supply. Therefore, athletes' endurance training should mainly focus on the training of maximum lactic acid production and acid tolerance, supplemented by aerobic oxidation energy supply. From the connotation point of view, the target response panorama, indicators reflect the local. The former is always principled and abstract to some extent, while the latter is specific and specific. From the point of view of stability, the target is relatively stable and not easy to change, while the indicators can be changed appropriately according to the focus of work in different periods on the premise of reflecting the target. Thus, individual training items and plans are given. As the user input progresses, the training items of all users are grouped, and all the generated results are aggregated at the end of the final input to generate a collective training plan and returned to the user. The classification mining in data mining is to find a reasonable description or model for each class in the case of known characteristics of training data and classification results, and then use these classification descriptions or models to identify new unknown data. sort. The requirements for athletes are also constantly improving. The existing athlete training program only includes the basic technical and tactical training of athletes. It is necessary to comprehensively cover the evaluation criteria of the most important psychological, ideological and cultural aspects of athletes.

4. Conclusion

In this paper, the evaluation index and index system of Athletes' physical fitness training based on data mining are studied. Physical fitness evaluation and prediction are concerned with the important information hidden behind these data. Data mining technology can be extracted from a large number of raw data. The construction of athlete training index system is based on the theories of physiology, psychology, pedagogy and kinematics. It follows the basic principles of goal, development, effectiveness, individuality, scientificity and universality and forms a practical training index system. Therefore, the evaluation index is decomposed by the designer of the evaluation index according to the evaluation objective, which can reflect the main factors of the concretization and behaviour of the essential characteristics of the evaluation object in some aspect. It is the basis for the value judgment of the evaluation object. It is stored in the database in the form of production rules, and also includes new rules generated in the decision-making process. The evaluation of the athlete's physical level should be based on the evaluation purpose, evaluation requirements, evaluation targets and training level. Firstly, the first-level indicators are determined, and then the secondary indicators are determined. Coaches must have a deep understanding of the main factors that influence the physical fitness level of athletes. This is the premise and basis for the innovation and continuous improvement of physical training. By calling data mining rules, we will gradually produce scientific and reasonable sports training programs to achieve organic integration

of sports, training and management. The system-generated program is tested in actual physical education.

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