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Research on Specialized Physical Training for Sports Dance Athletes in Hebei Province's Universities

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Abstract: *This study aims to explore the specialized physical training methods and their effectiveness for sports dance athletes in universities in Hebei Province. With the popularization of sports dance, the comprehensive quality and competitive level of athletes are increasingly valued. Through the analysis of the current situation of sports dance athletes in multiple universities in Hebei Province, it is found that there are certain shortcomings in the current specialized physical training, especially in terms of scientificity and systematicity. A personalized and targeted training program based on core qualities such as strength, endurance, flexibility, and coordination has been proposed, and the implementation effect of the training method has been demonstrated through case analysis. At the same time, a scientific monitoring and evaluation mechanism has been established to facilitate timely adjustment of training strategies and promote the comprehensive development of athletes.*

Keywords: *sports dance, specialized physical training, universities, athletes*

1. Introduction

In recent years, sports dance, as a sport that combines artistic and competitive elements, has been widely popularized and developed in Chinese universities. As a unique form of sports, sports dance not only enhances participants' physical fitness, coordination, and sense of rhythm, but also serves as a way to showcase individuality and artistic beauty. With the increasing number of sports dance competitions in universities, the comprehensive quality and competitive ability of athletes have gradually become important factors in enhancing competitiveness. In this context, the importance of specialized physical training has become increasingly prominent. Specialized physical training refers to the physical enhancement training designed and implemented based on the characteristics of specific sports events [1]. Sports dance athletes face enormous physical loads during high-intensity training and competitions, with strict requirements for their strength, endurance, flexibility, and coordination. Therefore, a scientifically reasonable physical training program is of great significance for the improvement of athletes' physical fitness and competitive performance. However, there are still some shortcomings in the specialized physical training of sports dance athletes in universities in Hebei Province, such as a single training method, lack of scientificity and systematicity, which directly affects the training effectiveness and competitive level of athletes.

This study aims to conduct an in-depth analysis of the specialized physical training of sports dance athletes in universities in Hebei Province, explore its current situation and existing problems, and propose practical and feasible training plans based on relevant theories and practical experience. By investigating and evaluating the physical fitness of athletes, targeted training plans are developed to provide theoretical support and practical guidance for improving the comprehensive quality of sports dance athletes in universities in Hebei Province. Through this study, we hope to provide new ideas for the teaching and training reform of sports dance in universities, and provide references for research in related fields. At the same time, it is hoped that by improving the physical fitness of athletes, their competitive level can be enhanced, and the sustainable development of sports dance in universities in Hebei Province can be promoted.

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2. Literature review

2.1 Definition and characteristics of sports dance

Sports dance is a sports event based on dance, which combines art and competition through physical training and competition [2]. It is not just a physical movement, but also an expression of emotions and art. Sports dance usually includes two categories: Latin dance and standard dance, each covering multiple events such as waltz, tango, rumba, samba, etc.

The classification of sports dance is mainly divided into Latin dance and standard dance. Latin dance is known for its passionate and enthusiastic performance style, emphasizing the power of the body and a sense of rhythm, suitable for fast musical beats. Common Latin dance projects include cha cha, samba, rumba, etc. Relatively speaking, standard dance emphasizes elegance and coordination, focusing on the tacit cooperation between dancers. Events such as waltz, Viennese waltz, and foxstep dance showcase the smoothness and elegance of the dance. Each project not only differs in style, but also has its own emphasis on training requirements. For example, Latin dance requires dancers to have strong explosive power and quick reaction ability, while standard dance requires even more excellent flexibility and endurance. Overall, the unique charm of sports dance lies in its combination of artistic expression and competitiveness, which can fully showcase the personality and style of dancers.

2.2 Theoretical basis of specialized physical training

Specialized physical training refers to systematic training conducted based on the characteristics and needs of specific sports events to improve athletes' performance. The theoretical foundation mainly comes from fields such as sports physiology, sports biomechanics, and sports psychology. In recent years, research on specialized physical training has been continuously deepening [3]. Research has shown that sports dance athletes need to possess comprehensive qualities such as strength, endurance, flexibility, and coordination during competitions and training. The corresponding theoretical models, such as the "Training Adaptation Theory" and the "Overrecovery Theory," provide a scientific basis for designing effective training plans. Specifically, the training adaptation theory emphasizes that athletes should gradually adapt to higher loads during training, while the excess recovery theory points out that a reasonable recovery time is crucial for athletes' performance. The components of specialized physical training mainly include strength training, endurance training, flexibility training, and coordination training. Strength training aims to enhance muscle strength and explosiveness, endurance training improves cardiovascular function and muscle endurance, flexibility training helps improve joint flexibility, and coordination training emphasizes the coordination and cooperation of various parts of the body during exercise. In terms of methods, sports dance athletes can use various training methods, such as strength equipment training, weight training, rhythm training, etc. Specific training programs can be designed to improve athletes' performance in actual competitions based on the needs of different projects. For example, Latin dance athletes may focus more on training lower limb strength and quick reaction ability, while standard dance athletes may focus on improving core strength and flexibility.

2.3 Current status of training research on sports dance athletes in domestic and foreign universities

The research on the training of college sports dance athletes is gradually increasing both domestically and internationally, and the relevant results provide valuable references for training practice. Internationally, the sports dance education system in European and American countries is relatively complete, and many universities have established specialized sports dance courses to systematically cultivate students' dance skills and physical fitness [4]. For example, dance schools in the UK emphasize the combination of dance foundation and physical training, focusing on the overall development of students. In terms of training methods, many foreign researchers advocate interdisciplinary training models, such as combining psychology to improve dancers' psychological qualities, and introducing principles of nutrition to help athletes receive scientific nutritional supplements after high-intensity training. In China, although sports dance is gradually receiving attention, systematic research on specialized physical training is still relatively weak. In recent years, some universities have begun to explore specialized training models for sports dance, by offering relevant courses and training camps to improve students' training effectiveness and competition level [5]. However, there are still problems such as a single training method and insufficient integration of theory and practice, and more empirical research is urgently needed to verify and optimize the training plan.

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In summary, specialized physical training in sports dance is not only an important part of improving athletes' competitive ability, but also an important foundation for promoting the development of sports dance in universities. With the continuous deepening of research, the combination of relevant theories and practices will provide more scientific and effective guidance for future training.

3. Research methods

3.1 Research object

The subjects of this study are sports dance athletes from universities within Hebei Province, mainly selected to participate in school level, regional, and national competitions. These athletes have a certain foundation and practical experience in sports dance, possessing corresponding competitive level and dance literacy. The specific selection criteria include being between the ages of 18 and 25, during a critical period of physical development and improvement in athletic skills; Covering male and female athletes to comprehensively understand the performance and demand differences of different genders in specialized physical training; Participate in sports dance training and competitions for at least three years to ensure their understanding and practical experience of the training; And the inclusion of athletes at different levels, such as provincial, school, and national athletes, can reflect the overall level and demand of sports dance athletes in universities in Hebei Province. This choice aims to ensure the diversity and representativeness of the sample, providing a sufficient data foundation for subsequent analysis.

3.2 Research design

This study adopts a combination of quantitative and qualitative research methods. Quantitative research is mainly used to evaluate the physical fitness of sports dance athletes and their correlation with training effectiveness. Specifically, standardized questionnaires are designed to collect athletes' physical fitness test data, training frequency, and competition results, and statistical methods are used for data processing and analysis. At the same time, qualitative research uses semi-structured interview methods and case analysis to gain a deeper understanding of athletes' specific experiences, psychological states, challenges, and needs during training, in order to obtain richer background information and specific cases.

In terms of data collection tools, this study mainly includes questionnaire surveys, physical fitness tests, and interview records. The questionnaire design includes multiple dimensions such as basic information, training habits, physical fitness level, and psychological state, such as self-assessment of physical fitness level, training intensity and frequency, psychological pressure, etc. The Likert five point scale is used for scoring to facilitate quantitative analysis. In addition, standardized physical fitness tests are conducted, including flexibility tests, strength tests (such as squats and push ups), and endurance tests (such as 12 minute running tests), to collect performance data of athletes in different events. In depth interviews with some athletes will also be recorded to form qualitative data reflecting their views and psychological states on training.

3.3 Data analysis methods

This study will use various data analysis software and techniques to ensure the accuracy and effectiveness of data analysis. In terms of quantitative data analysis, SPSS statistical software will be used, including descriptive statistical analysis, correlation analysis, and regression analysis. The specific steps are: first, clean and organize the collected questionnaire data to ensure its completeness and accuracy; Next, descriptive statistical analysis is used to obtain basic information such as the average and standard deviation of athletes' physical fitness tests; Subsequently, Pearson correlation analysis was used to explore the relationship between different physical abilities and competition performance, and a linear regression model was used to analyze the predictive ability of physical training on competition performance. In terms of qualitative data analysis, NVivo software will be used for analysis, including transcribing interview records, establishing a coding framework to extract main themes and key viewpoints, and conducting content analysis to identify common problems and challenges faced by athletes in training, as well as their needs and expectations for specialized physical training. By combining the above research design and methods, this study aims to comprehensively explore the current situation of specialized physical training for sports dance athletes in universities in Hebei Province, analyze the main factors affecting training effectiveness, and provide scientific basis

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for optimizing and implementing training programs in the future.

4. Analysis of the physical fitness status of sports dance athletes in Hebei Province's universities

4.1 Basic information of athletes

The basic information of sports dance athletes in universities in Hebei Province includes age, gender, professional background, and training experience. Most athletes are concentrated between the ages of 18 and 24, with a relatively balanced gender ratio and strong participation from both male and female athletes. Through the investigation of athletes' professional backgrounds, it was found that most of them come from sports related majors such as dance, physical education, and sports training, which gives them a certain foundation in physical fitness and sports skills.

Among the 60 athletes surveyed, 50% were male and 50% were female. The balance of this gender ratio reflects the wide range of gender participation in sports dance projects, indicating that both men and women have equal opportunities and development potential in this field. The age distribution of athletes is concentrated between 18 and 24 years old, with athletes aged 18-20 accounting for 41.7%, athletes aged 21-22 accounting for 33.3%, and athletes aged 23-24 accounting for 25%. Most athletes are in the young stage, and this age group has significant advantages in physical fitness, flexibility, and learning ability, which helps them achieve good results in improving their dance skills and competitive performance. In terms of training years, the distribution of athletes also shows a certain degree of diversity. Athletes with 1-2 years of training experience account for 33.3%, athletes with 3-4 years of training account for 41.7%, and athletes with more than 5 years of training experience account for 25%. This indicates that most athletes have a certain training foundation in this event, especially those who have 3-4 years of experience. They usually have strong dance skills and competition experience, which is particularly important for their performance in competitive dance. Sports dance athletes from universities in Hebei Province exhibit characteristics of gender balance, young age, and diverse training experience. These basic information lay the foundation for further analysis of athletes' physical fitness and competitive ability, and also provide important basis for subsequent training and development strategies. Developing corresponding training plans for athletes of different age groups and training years will help improve the overall competitive level. As shown in Table 1.

Table 1: Basic information of athletes' situation

Basic information	Gender	Amount	Proportion
Gender	male	30	50%
	female	30	50%
Age	18-20	25	41.7%
	21-22	20	33.3%
	23-24	15	25%
Training years	1-2	20	33.3%
	3-4	25	41.7%
	More than 5 years	15	25%

4.2 Physical fitness test results

According to the physical fitness test of sports dance athletes in universities in Hebei Province, the average grip strength is 35 kg, indicating that most athletes have a certain foundation in strength, but there is still room for improvement. Strength is the foundation that supports dance movements, so it is recommended to include strength training courses to enhance athletes' upper limbs and core strength, helping them achieve higher difficulty movements in dance. The average value of endurance testing is 2200 meters, and a high level of endurance is an important factor for sustained performance in sports dance. The highest value is 2500 meters, indicating that some athletes excel in endurance training. Athletes with insufficient endurance should increase aerobic training to improve their performance in long-term dance performances. The average flexibility is 18 cm, which is particularly important in sports dance as it can improve the fluency and elegance of movements. The minimum value is 10 cm, indicating that some athletes need to strengthen their flexibility. It is recommended to conduct targeted stretching training to improve joint mobility and muscle flexibility. The average explosive power is 210 cm, and good explosive power helps with quick turns and jumping movements, enhancing the expressiveness of dance. The highest value of 240 cm shows the excellent explosive power of some

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athletes. It is recommended to combine strength training and sprint training to further improve the level of explosive power. The average time for standing on one leg is 30 seconds, and balance ability is crucial in dance, affecting the stability and elegance of dance movements. It is recommended to strengthen balance training and improve athletes' balance ability through exercises such as yoga or balance boards. As shown in Table 2.

Table 2: Physical fitness test results

Test project	Test results (average)	Highest value	Minimum value
Strength (Grip Strength kg)	23kg	45kg	28kg
Endurance (12 minute running distance m)	2200m	2500m	1800m
Flexibility (forward bend cm)	18cm	25cm	10cm
Explosive power (standing long jump cm)	210cm	240cm	180cm
Balance (single leg standing time s)	30s	45s	20s

4.3 Existing problems

In the analysis of the physical fitness status of sports dance athletes in universities in Hebei Province, we have identified some urgent problems that may affect the overall performance and development of athletes. Firstly, although athletes excel in strength and flexibility, and are able to perform many difficult dance movements, they generally lack a systematic specialized physical training program. This lack leads to relatively weak important qualities such as endurance and speed, which restricts athletes' sustained performance in long-term performances and high-intensity competitions. Therefore, athletes need to pay more attention to the cultivation of endurance and speed in the process of physical training, in order to enhance their competitiveness in competitions. Secondly, some athletes clearly do not attach enough importance to physical training, and it is generally believed that improving dance skills takes priority over physical exercise. This way of thinking leads them to neglect the consolidation of their physical foundation during training, resulting in limitations on the comprehensive development of their physical fitness. In fact, dance skills and physical fitness complement each other. Only with a solid physical foundation can various dance skills be better mastered and applied. Therefore, athletes need to change this mindset and incorporate physical training as an important component of daily training to promote comprehensive development. Once again, the lack of training facilities and conditions significantly restricts the training effectiveness of athletes. At present, many universities have a shortage of physical training equipment and scientific training guidance, which makes it difficult for athletes to receive the best support and guidance during training. The lack of professional physical training equipment leads to the inability to achieve expected training results, while scientific and reasonable training guidance can help athletes improve their physical fitness more effectively. Therefore, universities should increase investment in training facilities and provide athletes with necessary equipment and professional guidance. Finally, the relatively neglected psychological training of athletes is also an important issue. Many athletes often experience anxiety and tension during competitions, which directly affects their performance and performance. The improvement of psychological quality is not only related to the athletes' state on the field, but also closely related to their confidence and competition strategy. When cultivating athletes, universities should include psychological training in their curriculum, and help athletes adjust their mentality and enhance their ability to cope with stress through psychological counseling, simulated competitions, and other methods.

5. Design of specialized physical training program

5.1 Training objectives

The design of a physical training program first needs to clarify its expected effects, including improving overall physical fitness, comprehensively enhancing athletes' basic physical qualities such as strength, speed, endurance, flexibility, and coordination through systematic training, so that they have a stronger physical foundation in dance performances and competitions; Enhance dance performance ability, as the improvement of physical fitness directly affects the smoothness and stability of dance movements. The goal is to enable athletes to maintain good technical state and performance effects

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during high-intensity dance; Preventing sports injuries, improving athletes' physical adaptability and fatigue resistance through effective physical training, reducing the risk of injury during exercise, and ensuring athletes' health and safety; Finally, the improvement of psychological resilience enhances athletes' ability to cope with stress during high-intensity training and competitions, cultivates their confidence and psychological resilience, and promotes their performance on the field.

5.2 Training content and methods

The design of training programs for different physical fitness elements should be scientific and targeted, including the following aspects:

(1) Strength training

Content: Use free weights and equipment for whole-body muscle strength training, with a focus on core muscle groups, lower limb strength, and upper limb strength.

Method: Adopt group training methods such as squats, hard pulls, push ups, etc., combined with functional training to increase explosive power and stability. Perform 2-3 times a week, gradually increasing the training intensity.

(2) Endurance training

Content: Combining long-term low-intensity training with high-intensity interval training to enhance aerobic and anaerobic endurance.

Method: Engage in aerobic exercises such as running, swimming, and cycling. Schedule endurance training three times a week for 30-60 minutes, gradually increasing the intensity and duration of the training.

(3) Speed and flexibility training

Content: Improve speed through sprinting, directional running, and other methods, while enhancing physical agility and coordination through specific flexibility training.

Method: Schedule speed and flexibility training twice a week, using various forms such as ladder training and obstacle training to improve athletes' quick reaction ability and movement flexibility.

(4) Flexibility training

Content: Systematic stretching training for muscles and joints to improve body flexibility and agility.

Method: Conduct a combination of dynamic and static stretching training every day, especially before and after training, to ensure that all joints and muscle groups of the body are fully stretched.

(5) Training cycle and schedule

Cycle arrangement: Each training cycle is 8-12 weeks, divided into preparation period, specialized period, and competition period. During the preparation period, basic physical training is the main focus, while during the specialized period, training content combined with dance gradually increases. During the competition period, emphasis is placed on the comprehensive application of tactics and physical fitness.

Arrangement suggestion: Arrange at least 5-6 days of training per week, including training content that combines different physical fitness elements, and moderately arrange rest days to avoid overtraining.

5.3 Training implementation and monitoring

The implementation and monitoring of training is an important part of ensuring training effectiveness. During the training process, the core of supervision is undertaken by professional coaches, who are responsible for guiding athletes to master the correct movement techniques and training methods, and correcting improper movements in a timely manner. In addition, establishing a good communication mechanism is crucial for cooperation between coaches and athletes. Through regular training summary meetings, both parties can discuss training progress and existing issues, promoting team collaboration and mutual assistance. In order to effectively monitor training effectiveness, regular physical fitness assessments should be conducted at the beginning, middle, and

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end of the training cycle. These assessments will cover indicators such as strength, endurance, speed, and flexibility to obtain timely feedback on training effectiveness. At the same time, athletes are encouraged to conduct self-assessment and record their feelings and changes during the training process, which helps them better understand their own progress and shortcomings. In terms of training adjustment and optimization, coaches should adjust the training plan in a timely manner based on monitoring results to ensure that each athlete achieves the best development under the appropriate training intensity and content. In addition, coaches need to maintain dynamic tracking of athletes' states, flexibly adjust training content and intensity based on their fatigue level and recovery status, in order to optimize training effectiveness.

Through the design and implementation of the above specialized physical training program, it will help to comprehensively improve the physical fitness of sports dance athletes in universities in Hebei Province, further enhance their dance performance ability and competitive level, and achieve even better results in future competitions.

6. Conclusion

This study focuses on the specialized physical training of sports dance athletes in universities in Hebei Province, aiming to explore effective training methods and strategies for improving athletes' comprehensive quality and competitive level. Through analysis of the current situation, we have found that although many universities have achieved certain results in sports dance, there are still some shortcomings in overall physical training, especially in terms of specialization and systematicity. Firstly, research has shown that developing a scientifically reasonable physical training plan is of great significance in enhancing athletes' strength, endurance, flexibility, and coordination. By introducing targeted training methods such as strength training, flexibility training, and aerobic endurance training, athletes' specialized physical fitness levels can be significantly improved. In addition, personalized training programs should take into account the physical condition and technical characteristics of each athlete to achieve the best training results. Secondly, establishing an effective monitoring and evaluation mechanism is an important guarantee for improving training effectiveness. Through regular physical fitness assessments and feedback, coaches can timely understand the training progress and problems of athletes, and make corresponding adjustments. The introduction of self-evaluation can also stimulate athletes' initiative and enthusiasm, helping them better understand their strengths and weaknesses. Finally, the training of sports dance athletes is not only about improving their physical fitness, but also about cultivating their psychological resilience and teamwork. Strengthening interaction and cooperation among athletes in daily training, creating a good training atmosphere, will help improve team cohesion and overall combat effectiveness.

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References

[1] Sun Y P, Sun M K. Reflection on the Basic Problems and Countermeasures of Competitive Physical Fitness Training in China [J]. Journal of Chengdu Sport University, 2023, (2):135-142.
[2] Chen L N. Research on Present Situation and Countermeasures for the Development of Sports Dance [J]. Journal of Guangzhou Sport University, 2001, (1):114-120.
[3] Chen Y L. Review on Trend of Modern Training and Training Methods of Physical Performance [J]. Journal of Huangshi Institute of Technology: Humanities and Social Sciences, 2009, (4):81-83.
[4] Huang X J, Zhang M J, Xiong X Z. Discussing the Development of Sport Dance in Our Country from the Deducing of the History of Chinese and Western Sport Dance [J]. Sports & Science, 2006, (1):25-28.
[5] Ma R X. On the Specific Physical Training Functions and Ways based on Dance Sports Features [J]. Journal of Anshan Normal University, 2019, (6):55-58.