

APPLICATION OF ATHLETIC TRAINING IN THE FIELD FOR UNIVERSITY STUDENTS



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APLICAÇÃO DO TREINAMENTO ESPORTIVO EM ATLETISMO DE CAMPO PARA UNIVERSITÁRIOS

APLICACIÓN DEL ENTRENAMIENTO DEPORTIVO EN EL ATLETISMO DE CAMPO PARA ESTUDIANTES UNIVERSITARIOS

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ABSTRACT

Introduction: There was a delay in China for the implementation of athletic physical training, often opting for technical and repetitive movements in their teaching method, resulting in an unsatisfactory didactic model. **Objective:** Innovate physical training technology for teaching athletics in colleges and universities. **Methods:** 80 students in two college and university athletics sports classes were submitted to two weekly athletics classes lasting 60 minutes. This paper measured and collected data before and after the battery of exercises, comparing the results pertinent to the group's physical fitness. All training lasted eight weeks. After this period, the relevant indices were measured again, ranked, and compared. **Results:** The research shows that physical training can improve students' athletic performance in different grades, and the effect of athletic gain in students with lower initial performance is more significant. At the same time, strengthening physical training can effectively improve the basal performance of athletics and reduce the occurrence of sports injuries, ensuring the safety of the sports experienced. **Conclusion:** Physical training can promote positive performance in athletics, deserving further research to popularize the implementation of athletic training in athletics for colleges and universities. **Level of evidence II; Therapeutic studies - investigation of treatment results.**

Keywords: Exercise; Physical Education and Training; Track and Field; Training Technics.

RESUMO

Introdução: Houve um atraso na China para a implementação do treino físico atlético, muitas vezes optando por movimentos técnicos e repetitivos em seu método de ensino, resultando num modelo didático insatisfatório. **Objetivo:** Inovar a tecnologia de treinamento físico do ensino de atletismo em faculdades e universidades. **Métodos:** 80 alunos em duas aulas de esportes de atletismo de Faculdades e universidades foram submetidos à duas aulas semanais de atletismo com duração de 60 minutos, este artigo mediu e coletou os dados antes e após a bateria de exercícios, comparando os resultados pertinentes à aptidão física do grupo. Todo o treinamento durou oito semanas. Após este período, os índices relevantes foram medidos novamente, classificados e comparados. **Resultados:** A pesquisa mostra que o treinamento físico pode melhorar o desempenho atlético dos alunos em diferentes séries, e o efeito de ganho esportivo em alunos com menor desempenho inicial é mais significativo. Ao mesmo tempo, o fortalecimento do treinamento físico pode melhorar efetivamente o desempenho basal do atletismo e reduzir a ocorrência de lesões esportivas, garantindo a segurança dos esportes experimentados. **Conclusão:** O treinamento físico pode promover rendimento positivo nos esportes de atletismo, merecendo mais pesquisas afim de popularizar a implementação do treinamento esportivo em atletismo para as Faculdades e universidades. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Exercício Físico; Educação Física e Treinamento; Atletismo; Técnicas de Treinamento.

RESUMEN

Introducción: En China se ha producido un retraso en la implantación del entrenamiento físico atlético, optando a menudo por movimientos técnicos y repetitivos en su método de enseñanza, lo que ha dado lugar a un modelo didáctico insatisfactorio. **Objetivo:** Innovar la tecnología de entrenamiento físico de la enseñanza del atletismo en colegios y universidades. **Métodos:** 80 estudiantes de dos clases de deportes de atletismo de la universidad fueron sometidos a dos clases semanales de atletismo de 60 minutos de duración, este trabajo midió y recogió los datos antes y después de la batería de ejercicios, comparando los resultados pertinentes a la aptitud física del grupo. La formación completa duró ocho semanas. Tras este periodo, se volvieron a medir los índices pertinentes, se clasificaron y se compararon. **Resultados:** La investigación muestra que el entrenamiento físico puede mejorar el rendimiento deportivo de los estudiantes en diferentes grados, y el efecto de la ganancia deportiva en los estudiantes con menor rendimiento inicial es más significativo. Al mismo tiempo, el fortalecimiento del entrenamiento físico puede mejorar eficazmente el rendimiento basal del atletismo y reducir la aparición de lesiones deportivas, garantizando la seguridad de los deportistas experimentados. **Conclusión:** El entrenamiento físico puede promover un rendimiento positivo en los deportes de atletismo, mereciendo una mayor investigación con el fin de popularizar la implementación del entrenamiento en el atletismo para los colegios y universidades. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Ejercicio Físico; Educación y Entrenamiento Físico; Atletismo; Técnica Formativa.



INTRODUCTION

Track and field is one of the most popular sports in the world and has a long history. It is often referred to as the base of motion, the mother of motion or the origin of motion. Track and field is not only a sports activity that challenges the limits of the human body, but also has developed into a relatively high-level and standardized mature system in terms of competition. Track and field sports can effectively exercise basic quality and have excellent fitness function. Track and field is an important curriculum item in China's higher education. With the gradual implementation of physical education curriculum reform, the reform of physical education teaching in Chinese colleges and universities has been deepened and developed, and its teaching contents and teaching methods have also undergone significant changes.¹ After summarizing the views of various experts, it can be seen that physical fitness in the narrow sense mainly refers to sports quality, that is, basic qualities such as speed, strength, endurance, agility and flexibility; In a broad sense, physical fitness is expressed as individual sports quality, body shape and function, which is also an important embodiment of athletes' competitive ability. It can be seen from the literature that in the research of physical fitness training, it can be divided into the following contents: single exercise training and compound exercise training. This kind of training can be further divided into fast exercise training, anti load exercise training, continuous exercise training and rapid response training.²

According to the literature, the current situation of physical training in China has the following characteristics: the design of physical training items is chaotic and blind; Physical training lacks scientific guidance, and there are many problems, such as the single content of physical training. The literature points out several problems existing in the physical training of track and field events in China: for example, the understanding of physical training itself is not clear; Relevant concepts and methods are backward; The level of physical training and scientific research is low; Blind physical training for young athletes; The cognition of physical limit and the ability of athletes to adapt to the external environment are weak. It can be seen from relevant studies that China started late in track and field physical fitness training, and there is no accumulation of theory and practice, and there is no system. It has blindness in many aspects. The physical fitness teaching scheme design for track and field is relatively simple, and the teaching methods are relatively traditional. It often chooses repeated technical sports actions for teaching in the actual teaching process, such as repeated running, jumping, throwing and other technical actions, Therefore, the teaching effect is not satisfactory.³ The effect of track and field physical training largely depends on the advanced, reasonable and scientific methods and technologies used in teaching and training. Therefore, how to innovate physical training technology is the main subject of scientific track and field teaching in Colleges and universities.⁴

METHOD

Experimental design of physical training

In order to better coordinate the time of physical training of track and field sports, this paper takes 80 students in two track and field sports classes in Colleges and universities as the research object, twice a week, and the duration of each training includes 10 minutes of warm-up exercise, 45 minutes of physical training and 5 minutes of relaxation and stretching, a total of 60 minutes. The study and all the participants were reviewed and approved by Ethics Committee of Xi'an Peihua University (NO. ANUP004-20). The specific methods of physical training are shown in Table 1. The comprehensive track and field results and physical fitness indexes (including standing triple jump, squatting 100m, 1-minute sit ups and 4x10m turn back run) are compared before the start of the exercise

Table 1. Physical training methods of track and field sports.

Special training name	Specific training method
Strength quality	Bread push, deep squat, half-deep squat, standing multi-level jump, rapid, long distance step, weight-bearing, step jump
Speed quality	30-100 m run, 30-60 meters accelerate, 40-60 meters make it get started, rapidly raising your legs, after running, special testing and competition, 40-60 meters away from the start, 150 meters, 120 meters Intermittent
Sensitive quality	"Of" word run, sensitivity game, "J" to help run, bow arrows, action, obstacle, shouting group according to the password
Endurance quality	60 meters, rest, 10 meters, rest 120 meters, running in 300 meters, running at different distances
Flexible quality	Neighbor legs, bow and arrows, legs, sterile, supine stretching, help shoulders, hands holding guns, walking around each direction

FMS test indicators (including squat, hurdle step, straight lunge, shoulder flexibility, active straight leg lifting, trunk stability push ups, trunk rotational push ups) were measured and collected. The whole training lasted for eight weeks, reducing the interference of external factors as much as possible in the form of intra group comparison. After eight weeks, the relevant indicators were measured again, sorted and compared.

Questionnaire design, distribution and recovery

In order to explore the effectiveness of physical exercise and the satisfaction of this experimental method, this paper designs relevant questionnaire questions, including "cognition of the importance of physical training in track and field" and "satisfaction of physical training in track and field". After the experiment, 80 students were distributed and recovered through offline methods, and a total of 80 questionnaires were obtained.

RESULTS

Effect analysis of physical training

In order to determine the score improvement effect of students in different score segments before and after sports training, this paper measured the comprehensive track and field scores before and after training, as shown in Table 2, and divided the scores into the first 50% average score, the last 50% average score and the last 50% average score, so as to make the research results more obvious. The results showed that the first 50% average score changed from (75.293 ± 3.478) before physical training to (85.652 ± 2.849) after physical training, $P < 0.05$; The average score of the latter 50% increased significantly from (36.384 ± 0.910) before physical training to (60.080 ± 1.131) after physical training ($P < 0.05$). It can be seen that physical training can effectively enhance students' comprehensive track and field performance, and the improvement effect is more significant for students with poor track and field performance.

The comparison results of students' physical fitness indexes before and after training are shown in Table 3. The study shows that the performance of standing triple jump changes from (8.260 ± 0.344) m before physical training to (9.423 ± 0.425) m after physical training, $P < 0.05$; The results of squatting 100m ranged from (12.258 ± 0.539) s before physical training to (11.751 ± 0.227) s after physical training, $P < 0.05$; The results of 1-minute sit ups increased from (53.569 ± 5.572) before physical training to (60.609 ± 4.785) after physical training ($P < 0.05$); The results of 4x10m turn back run increased significantly from (9.840 ± 0.436) s before physical training to (9.574 ± 0.356) s after physical training ($P < 0.05$). It can be seen that physical training can effectively enhance the basic physical quality of track and field, so as to increase students' track and field ability from all aspects, so as to improve sports performance.

As shown in Table 4, before and after training, the squat performance of students changed from (2.111 ± 0.355) before physical training to (2.618 ± 0.508) after physical training, $P < 0.05$; The results of hurdle step changed from (2.044 ± 0.294) before physical training to (2.578 ± 0.489) after physical training ($P < 0.05$); The results of shoulder flexibility changed from (2.160 ± 0.396) before physical training to (2.538 ± 0.499) after physical training ($P < 0.05$); The results of active straight leg lifting increased from (2.171 ± 0.411) before physical training to (2.618 ± 0.508) after physical training ($P < 0.05$); The results of trunk stability push ups increased significantly from (2.289 ± 0.477) before physical training to (2.720 ± 0.477) after physical training ($P < 0.05$). The results of trunk rotary push ups changed from (2.044 ± 0.284) before physical training to (2.335 ± 0.460)

Table 2. Comparison of track and field comprehensive results before and after training.

Score	Before training	After training	T	P
Top 50% average	75.293±3.478	85.652 ±2.849	8.533	0.0045
50% average score	36.384 ±0.910	60.080 ±1.131	10.957	0.0066

Table 3. Comparison of physical fitness indexes of students before and after training.

Option	Before training	After training	T	P
Left three-level jump	8.260 ±0.344	9.423 ±0.425	-8.189	0.0043
Ignite 100m	12.258 ±0.539	11.751 ±0.227	4.997	0.0054
1 minute sit-ups	53.569 ±5.572	60.609 ±4.785	3.033	0.0073
4x10m folding	9.840 ±0.436	9.574 ±0.356	3.134	0.0275

Table 4. Comparison of FMS test indexes of students before and after training.

Option	Before training	After training	T	P
Deep squat	2.111 ±0.355	2.618 ±0.508	-3.437	0.0000
Hurdle step	2.044 ±0.294	2.578 ±0.489	-3.613	0.0000
Straight bow arrow	2.220 ±0.245	2.709 ±0.477	-2.894	0.0607
Shoulder flexibility	2.160 ±0.396	2.538 ±0.499	-2.325	0.0202
Active straight leg	2.171 ±0.411	2.618 ±0.508	-2.528	0.0100
Torso stability push-ups	2.289 ±0.477	2.720 ±0.477	-2.495	0.0101
Trip rotation push-ups	2.044 ±0.284	2.335 ±0.460	-1.921	0.0599

after physical training ($P > 0.05$); The performance of straight lunge increased from (2.220 ± 0.245) before physical training to (2.709 ± 0.477) after physical training ($P > 0.05$), but there was no significant difference. It can be seen that effective physical training can improve the scores of students' FMS test, so as to reduce the sports injury in the process of sports training.

Evaluation and analysis of physical fitness teaching

As shown in Figure 1, on the issue of "cognition of the importance of physical training in track and field sports", 15 people think "very important", accounting for 18.75%; The number of people who think "important" is 27, accounting for 33.75%; The number of people who think "average" is 21, accounting for 26.25%; The number of people who think "unimportant" is 10, accounting for 12.50%; The number of people who think "very unimportant" is 7, accounting for 8.75%. This shows that after physical training, most students understand the significance of physical training, but the current understanding of the importance of physical training still stays in the case of "important" and "general", so it needs further research and deepening.

As shown in Figure 2, on the issue of "satisfaction of physical training in track and field sports", 12 people think they are "very satisfied", accounting for 15.00%; The number of people who think they are "satisfied" is 31, accounting for 38.75%; The number of people who think "average" is 22, accounting for 27.50%; The number of people

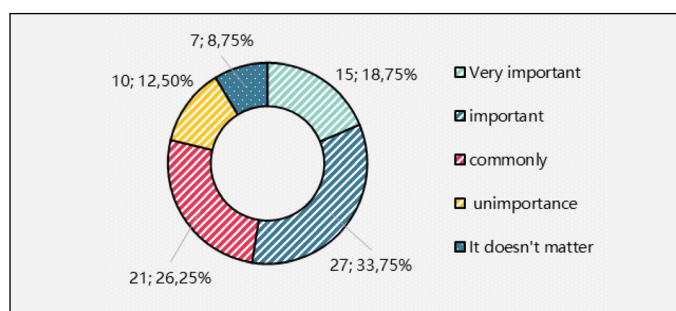


Figure 1. Cognition of the importance of physical training in track and field sports.

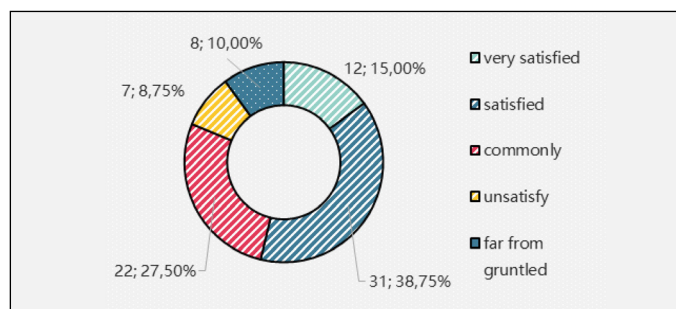


Figure 2. Satisfaction of physical training in track and field.

who think they are "dissatisfied" is 7, accounting for 8.75%; The number of people who think they are "very dissatisfied" is 8, accounting for 10.00%. This shows that the current physical training methods can satisfy most people, but they still need to be further improved.

DISCUSSION

Through the survey, it is found that due to the insufficient allocation of physical education teachers in Colleges and universities, each teacher will teach a large number of students, so most teachers can not provide personalized guidance to students, and the content of the overall training plan is also based on groups. Therefore, when arranging physical training tasks, teachers can not fully consider the physical conditions and actual characteristics of different athletes, and can not teach students according to their aptitude. Therefore, athletes have different load conditions in the actual training tasks. For example, for athletes with poor physical quality, heavy training tasks will make it difficult to adjust, thus affecting the overall training plan; Although other athletes have excellent physical quality, the actual exercise load may not meet their competition requirements. Athletes will feel that the intensity of training tasks is not enough, which not only leads to the lack of improvement of sports performance after training, but also may induce sports diseases and injuries.⁵ Therefore, a good physical education teacher's skill should include guidance and training, team management, scientific research ability and innovation ability. The investigation found that teachers' professional title, educational background and high-level sports experience are one of the main factors affecting the effect of physical education teaching. Therefore, when choosing college track and field teachers, we should consider their academic qualifications and experience. Teachers should develop their skills in an all-round way: strengthen the study of physical training theory and improve their understanding of physical training; Pay attention to students' physical exercise.⁶

After analyzing the factors affecting students' physical training, it is found that students' own factors also have a significant impact on their physical training. After the investigation of students, it is found that students' physical training knowledge is relatively weak, and their sports injury prevention and self-defense knowledge is relatively poor. It is found that there is a large gap between the reasonable training

time and learning time of athletes, and the reasonable training time and learning time of athletes, which has a strong impact on students' physical training.

CONCLUSION

This paper designs the research method of physical training and discusses its application in college track and field. The results show that physical training can improve the comprehensive track and field performance of students in different grades, and the sports effect of students with lower performance is more significant. At the same time, strengthening physical training can effectively improve the basic track

and field sports performance, and reduce the occurrence of sports injuries to a certain extent, so as to ensure the safety of sports. The experimental results show that physical training plays a good role in promoting track and field sports, so it is worth popularizing in track and field training in colleges and universities. According to the satisfaction survey, although the current track and field physical fitness training program has been highly praised, there are still many areas that need to be improved, so it needs to be further adjusted and improved.

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AUTHORS' CONTRIBUTIONS: The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. ML: writing and execution.

REFERENCES

1. Ince ML. Supporting learning of practitioners and early career scholars in physical education and sports pedagogy. *Sport Educ Soc*. 2019;24(6):584-96.
2. Wahlund H. Determination of the physical working capacity: a physiological and clinical study with special reference to standardization of cardio-pulmonary functional tests. *Act Med Scand Suppl*. 1948;132(215):1-78.
3. Wirth K, Keiner M, Hartmann H, Sander A, Mickel C. Effect of 8 weeks of free-weight and machine-based strength training on strength and power performance. *J Hum Kinet*. 2016;1(53):201-10.
4. Frainer DES, Roza TH, Morastoni CC, Pazin J, De-Oliveira FR. Teste progressivo de marcha atlética em pista: efeitos do treinamento de curto prazo. In: Congresso Brasileiro de Metabolismo, Nutrição e Exercício. I Congresso Brasileiro de Metabolismo, Nutrição e Exercício, Londrina, PR; 2006.
5. Pastre CM, Carvalho Filho G, Monteiro HL, Netto Jr J, Padovani CR. Sports injuries in the elite of Brazilian athletics: a study based on reported morbidity. *Rev Bras Med Esporte*. 2005;11(1):43-7.
6. Pardono E, Fernandes MO, Azevêdo LM, Almeida JA, Mota MR, Simões HG. Post-exercise hypotension of normotensive young men through track running sessions. *Rev Bras Med Esporte*. 2015;21(3):192-5.