

AEROBIC TRAINING METHODS FOR HIGH SCHOOL SOCCER

MÉTODOS DE TREINO AERÓBICO PARA O FUTEBOL DE ENSINO MÉDIO

MÉTODOS DE ENTRENAMIENTO AERÓBICO PARA EL FÚTBOL DE LA ESCUELA SECUNDARIA



ORIGINAL ARTICLE
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Wang Yonggang¹ 
(Physical Education Professional)
Zhu Xiaoyu¹ 
(Physical Education Professional)

1. Northeast Agricultural University,
Harbin, Heilongjiang, China.

Correspondence:

Zhu Xiaoyu
Harbin, Heilongjiang, China.
150030.
18875009549@163.com

ABSTRACT

Introduction: Fatigue impairs exercise activity in high school students, and it is detrimental to explore aerobic training when fatigue cannot be alleviated. This factor limits the ability to exploit the full potential of young athletes for soccer. **Objective:** Implement a healthy development protocol for soccer application in high school. **Methods:** This article used a literature review among other research methods. The analysis was devoted to aerobic training for endurance in soccer for students in high school. The specific methods of implementing the developed protocol in high schools were studied. Finally, effective measures for improving students' physical fitness were presented. **Results:** Judging from the situation, the duration of each training session in high school soccer is closely related to the coaches' ability. High-level coaches tend to organize the duration of training according to the perceived effects in soccer practice, considering the physical and technical characteristics of the sport itself. **Conclusion:** Soccer endurance training can also promote the long-term development of soccer education while meeting students' actual exercise needs. It is important to carry out soccer aerobic training applied to high school. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Middle Schools; Soccer; Endurance Training.

RESUMO

Introdução: A fadiga prejudica a atividade do exercício físico nos alunos do ensino secundário, sendo prejudicial explorar os treinos aeróbicos quando a fadiga não pode ser aliviada. Esse fator limita a capacidade de explorar o máximo potencial de jovens atletas para o futebol. **Objetivo:** Implementar um protocolo de desenvolvimento sadio para a aplicação do futebol no ensino médio. **Métodos:** Este artigo utilizou a revisão bibliográfica entre outros métodos de investigação. A análise foi dedicada ao treino aeróbico para a resistência no futebol dos estudantes no ensino médio. Estudou-se os métodos específicos de implementação do protocolo elaborado nas escolas de ensino médio. Finalmente, foram apresentadas as medidas eficazes para melhorar a condição física dos estudantes. **Resultados:** A julgar pela situação em tela, a duração de cada sessão de treino no futebol do ensino médio está intimamente relacionada com a capacidade dos treinadores. Os treinadores de alto nível tendem a organizar a duração do treino de acordo com os efeitos perceptíveis na prática do futebol, considerando as características físicas e técnicas do próprio esporte. **Conclusão:** A formação de resistência no futebol pode também promover o desenvolvimento a longo prazo da educação futebolística ao mesmo tempo em que satisfaz as necessidades reais de exercício físico dos estudantes, sendo de grande importância realizar a formação do treino aeróbico no futebol aplicado ao ensino médio. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Ensino Médio; Futebol; Treino Aeróbico.

RESUMEN

Introducción: La fatiga perjudica la actividad del ejercicio en los estudiantes de secundaria, y es perjudicial explorar el entrenamiento aeróbico cuando la fatiga no se puede aliviar. Este factor limita la capacidad de explotar el máximo potencial de los jóvenes deportistas para el fútbol. **Objetivo:** Implementar un protocolo de desarrollo saludable para la aplicación del fútbol en la escuela secundaria. **Métodos:** Este artículo utilizó, entre otros métodos de investigación, la revisión de la literatura. El análisis se dedicó al entrenamiento aeróbico de resistencia en el fútbol para estudiantes de secundaria. Se estudiaron los métodos específicos de aplicación del protocolo elaborado en los institutos. Por último, se presentaron las medidas eficaces para mejorar la aptitud física de los alumnos. **Resultados:** A juzgar por la situación en la pantalla, la duración de cada sesión de entrenamiento en el fútbol de la escuela secundaria está estrechamente relacionada con la capacidad de los entrenadores. Los entrenadores de alto nivel tienden a organizar la duración del entrenamiento en función de los efectos percibidos en la práctica del fútbol, teniendo en cuenta las características físicas y técnicas del propio deporte. **Conclusión:** El entrenamiento de la resistencia en el fútbol también puede promover el desarrollo a largo plazo de la educación futbolística al tiempo que satisface las necesidades reales de ejercicio físico de los estudiantes, y es de gran importancia llevar a cabo la formación del entrenamiento aeróbico en el fútbol aplicado a la escuela secundaria. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descritores: Educación Secundaria; Fútbol; Entrenamiento Aeróbico.



INTRODUCTION

In the current campus football training, although physical education teachers and football coaches are aware of the important role of physical education in students' development and pay special attention to students' healthy development, there are still many problems in the specific operation process, such as the conflict between high school study and physical training; Football endurance training needs to be carried out step by step, but because many school teachers lack professional competition experience and their own teaching ability/experience is not high, the training system is not perfect, and it is difficult to provide more guarantee for the growth and progress of students.¹ Football endurance training can not only meet the actual needs of students' physical exercise, but also promote the long-term development of football education. Therefore, it is of great significance to carry out football endurance training in high school campus.

For high school football training, endurance training with corresponding intensity can already be carried out, especially football endurance training is the key. This requires high school physical education teachers to constantly reform and be brave in innovation in high school football teaching.²⁻³ In high school football training, teachers should use scientific training methods, reasonable practical arrangements, and step-by-step teaching methods, so that students' physical and mental health can be better developed and their training deficiencies can be improved. In this paper, literature review and other research methods are adopted. This paper analyzes the significance of carrying out special endurance training in high school campus football, and on this basis, puts forward the strategies for students' physical function recovery.

Significance of endurance training of high school football

The study is Purely observational and literature studies which no need to registry ID of ICMJE, and all the participants were reviewed and approved by Ethics Committee of Northeast Agircultural University, China (NO. 20221021)

Improve the comprehensive quality of senior high school students

The energy supply in high school football is mainly aerobic energy supply. Special aerobic endurance of football refers to the ability of players to engage in football for a long time with sufficient oxygen supply. The purpose of high school football aerobic endurance training is to improve students' ability to absorb, transport and utilize oxygen in sports, so as to speed up their metabolism, thus accelerating their self-recovery ability in sports. The endurance training of high school football is no longer limited to examining the mastery of high school students' football skills, but focuses on the cultivation of high school students' endurance and psychological stress resistance.⁴ In order to encourage senior high school students to keep a good psychological state in the process of formal football matches, and fully reflect the maximum value of training effect.

Promote the healthy growth of high school students

Football exercises play a very important role in physical exercises in colleges and universities, but for endurance training, it is necessary to take scientific and reasonable ways to constantly improve and help students get more protection in their own growth and progress. On the one hand, it is controlled within the ability of students; On the other hand, it can reduce the impact on students' physical limits. The ideas and methods of special endurance training of high school football need to actively communicate with the students, and observe whether the students can welcome them in the endurance training process. Do not take compulsory measures to complete it, otherwise it will be difficult to get good training results.

Because of the different environment, each senior high school student's ability to accept and practice football is different. At the same time, football training requires high physical fitness for senior high school students. Some students usually exercise themselves for a long time, so the persistence of physical fitness in football training is high, while some students usually exercise themselves for a short time and have poor physical fitness.^{5,6} As a group of teenagers, football can not only effectively interfere with participants' health, but also effectively relieve teenagers' learning pressure. At the same time, its interesting and competitive characteristics are also helpful to cultivate teenagers' participation motivation and enthusiasm. In the application of the continuous training method, it is more to combine the continuous practice of the ball, so that the aerobic endurance training combined with some football movements is more targeted. For example, the continuous dribbling practice of various parts of the foot not only improves the aerobic endurance but also improves the dribbling ability to some extent. It can also help students lay a good physical foundation and effectively avoid the risk of accidental injuries to senior high school students.

Current situation of endurance training of high school football

The subjects of this paper are football coaches in three high schools and some students who participate in campus football training. There are two ways to distribute the questionnaire. One is to distribute the questionnaire on the spot by taking part in football-related events or other competition exchange activities on campus, and the other is to distribute the questionnaire online.

Cognition of special endurance training

Decide cognitive choices and actions, and theory guides practice. Correct cognition can effectively guide training practice and achieve twice the result with half the effort. On the contrary, it will hinder the training effect and get twice the result with half the effort. Only when coaches have correct cognitive ability can they drive students to understand and digest.

According to the theory of sports training, endurance training plays a very important and fundamental role in football. From the results in Table 1, it can be seen that pupils' cognition of physical fitness is very low. Basically, they don't know the important basic function of physical fitness, and some primary school students don't know what physical fitness is. Therefore, physical education teachers should combine theory with practice in teaching and training.

Training time allocation

From the data shown in Figure 1, it can be seen that in high school campus football training, most of the schools train 3-5 times a week, while the number of schools that choose more than 6 times a week is relatively small. No routine daily training is organized, and even some high school athletes reflect that the school has not clearly stated when and how often to train.

Judging from the actual situation at this stage, the length of each training session of college campus football is closely related to the coaching ability of coaches. High-level coaches will arrange the training duration according to the actual football training effect and the physical and technical characteristics of the sport itself. The training time can not only ensure that athletes receive enough physical and technical practice.

Table 1. Cognitive statistical results of special endurance training.

| Cognitive degree | Total number of people | Proportion/% |
|---------------------|------------------------|--------------|
| Very important | 163 | 43.7 |
| Generally important | 101 | 27.1 |
| Unclear | 92 | 24.7 |
| Unimportance | 17 | 4.6 |

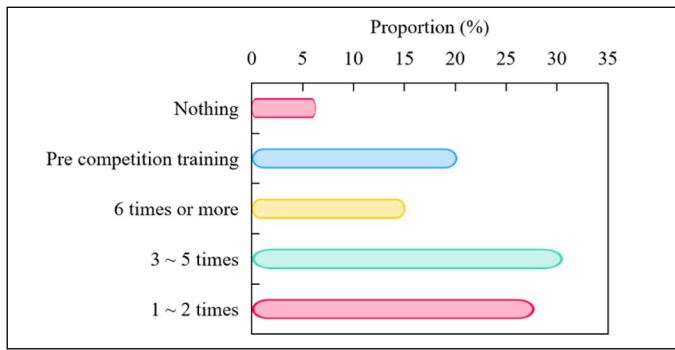


Figure 1. Number of training sessions per week.

Factors affecting students' training

For modern schools, sports facilities are just the necessities of school infrastructure, and football fields, basketball courts, volleyball courts and other sports venues are the conditions and requirements of school construction and development. Figure 2 shows the statistical results of training factors affecting students.

We can see that the venue equipment has become the main factor in the training of teenagers, accounting for 43%. This shows that many schools have failed to improve the details of some sports team training. Therefore, in the competition, we can clearly see that many students are very thin in body shape and poor in strength. Coaches also try their best to make up for it in training, and try their best to ensure the balanced development of students in endurance training.

Training methods of special endurance of football on campus

Improve the cognition of training

In the process of training and cognitive improvement, physical education teachers should conduct in-depth research on new ideas/methods, both in terms of personal experience and theoretical research, so as to get better results in the process of growth and progress. Strictly control the training intensity of senior high school students according to the intermittent time, so as to maximize the efficiency of intermittent training. Although aerobic energy supply is the main time in football matches, anaerobic energy supply is needed in some key times of the transition between attack and defense.^{7,3} For example, short-distance sprint, dribbling, passing and catching, steals the ball, shooting are mainly anaerobic functions, which are also the key moments to decide the outcome in football matches.

In case of difficulties, it is necessary to teach athletes how to give full play to their skills, which requires athletes not only to enhance their sense of teamwork in daily training, but also to learn to solve and coordinate problems independently and give full play to their best competitive level. Teachers can demonstrate and analyze through multimedia technology. This is because relying solely on the teacher's own explanation can't analyze the movements in all directions, which is not conducive to students' understanding. The application of multimedia technology can make students have a scientific cognition of football training in junior high school campus, so as to give full play to their own advantages according to scientific methods.⁸ For example, after the intense training, teachers can play some funny football videos to reduce the training pressure of students and relieve their nervous tension.

Plan training time reasonably

The training schedule is particularly important for campus football. The main task of students in school is to study cultural lessons, and sports training should be conducted on the premise of not delaying cultural lessons, so the training schedule of campus football is very compact.⁹ First of all, coaches should try their best to make use of the morning time for short-term technical training to help athletes lay a good foundation,

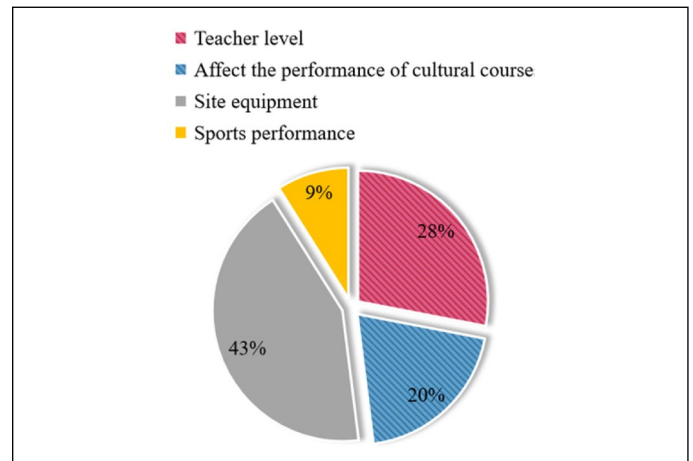


Figure 2. Statistical results of factors affecting students' training.

but remember that the amount of training in the morning training must be well controlled and not too large, so as not to cause fatigue and affect students' all-day cultural studies. First, it won't delay students' class time; second, it will take more than 90 minutes to add up the two times, which can fully arrange the training content and carry out targeted training.

The duration of each activity must be more than 10s and less than 1min. If it is too long or too short, it can't produce high lactic acid value, which can't achieve the goal of anaerobic endurance training. In the process of improving endurance, take one hour as the benchmark, so that students can keep even breathing during the exercise within one hour without serious wheezing, which means that students have certain achievements and abilities, and then the training intensity can be appropriately improved.

The number of training in the summer vacation must be increased, and each training time should reach 90 minutes to 120 minutes. Keep at least 1-2 training sessions a day, that is, the arrangement of 10-12 training sessions a week, in which corresponding changes can be made before the game to prevent the young players from being physically tired and injured.¹⁰ There are two main forms of special endurance training interval time in senior high school, one is to fix the interval time, and the other is to gradually shorten the interval time. Moreover, the arrangement of intermission time also depends on the intensity of training load and the distance of load. If the load is strong and the distance is long, the intermittent time can be appropriately increased.

In terms of tactics, it can be gradually increased from a simple two-to-one approach, and you can also practice some flank tactical training and middle and front tactical training until the overall tactical exercise. You can also give direct guidance in the competitions within the team, so that the players can experience various changes in tactics.

Optimize the endurance training goal of campus football

First of all, it is necessary to effectively link the goals of the campus football training plan in junior and senior high schools. In formulating training objectives, on the one hand, we should link up the training objectives of junior high school and senior high school in terms of endurance training and technical and tactical training, so as to ensure the continuity of the training objectives of campus football in the two school-age stages.

Secondly, the comprehensive development of students should be the core goal of training. On the one hand, it is necessary to ensure the improvement of students' special skills. In the training design, it is necessary to clearly put the learning of students' special knowledge and skills in the first place, so as to ensure that students can achieve the improvement of special football sports ability after a period of training.

Thirdly, it is necessary to build different levels of campus football matches at the county, municipal, provincial and national levels, and

encourage all schools to participate in the corresponding levels of campus football matches according to their own development level.

Finally, it is necessary to optimize the scientific level of the existing training method system, closely combine the selection of training methods with the physical development level and characteristics of young football players, and actively absorb some discipline theories of sports training and sports physiology to ensure that the implementation of the whole training method is evidence-based.

Optimize the teaching staff

Schools with conditions should consider providing more professional endurance training coaches, while schools without conditions should also provide football team coaches with opportunities to learn endurance training professional knowledge. When recruiting new teachers, schools should give priority to football teachers. Sports teachers or coaches must enrich the means and methods of endurance training and apply sports games to endurance training of football events. Local governments at all levels should strengthen supervision over whether the manpower, financial resources and material resources of the football team have been implemented. Local governments can also include the advantages and disadvantages of the development of football in the performance evaluation of the leaders of local education departments.

Strategies for students' physical function recovery

Pay attention to nutritional recovery

After training, there is a great energy consumption, so we should pay attention to the timely intake of nutrients. After exercise, the energy supplement should not only be sufficient in quantity, but also pay attention to the reasonable collocation of different nutrients such as carbohydrates, protein and vitamins. After exercise, sugar supplementation can accelerate the storage and recovery of glycogen in all parts of the body. And the supplement of vitamins and various trace elements is an essential part, which plays a positive role in the recovery after exercise.

Adjust the daily training intensity reasonably

Set a reasonable training load in each training class, design the matching training intensity and amount according to the different periods of the training cycle, such as competition cycle and recovery cycle, and strictly grasp the training load. Conditional monitoring instruments can reflect the load situation, and when equipment is lacking, athletes can help coaches control and adjust the training intensity and quantity in time by self-testing their heart rate and pulse during training.

Reasonably allocate training resources, and pertinently adjust the interval time and training intensity according to students' daily training effect. While meeting students' actual learning needs, we should improve training efficiency, integrate football endurance training into students' daily learning life, guide students to establish lifelong sports awareness, cultivate students' good football endurance training habits, and further promote students' collective quick recovery goal.

CONCLUSION

The energy supply in high school football is mainly aerobic energy supply. Special aerobic endurance of football refers to the ability of players to engage in football for a long time with sufficient oxygen supply. As a group of teenagers, football can not only effectively interfere with participants' health, but also effectively relieve teenagers' learning pressure. At the same time, its interesting and competitive characteristics are also helpful to cultivate teenagers' participation motivation and enthusiasm. We should also pay attention to the timely recovery after training, and combine work with rest, so that high school students can not only improve their special endurance but also relieve their psychological pressure and promote the healthy development of their body and mind.

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