

Study on Aerobic Training of Cross-Country Skiers

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Abstract: Motocross and known as snow skiing marathon, to an athlete's actual ability to the specific requirements of the physical quality level put forward the more strict, a good snow motocross and skiing athletes first should also must be familiar with the high quality of actual movement strength, patience, speed, agility and the comprehensive ability to coordinate with each other, This requires us to pay for the hard work and efforts, to combine aerobic training and anaerobic training in the training process, the most important is to carry out aerobic training. Aiming at the lack of scientific and reasonable aerobic training for cross-country skiers, the scientific aerobic training methods and training load degree are formulated for cross-country skiers, so as to enhance the athletes' physical quality and improve the results of cross-country skiing. Aerobic training, is a periodic training process, training to have standard movement posture, otherwise it is to cause serious injury to the body. Through aerobic training for cross-country skiers, this paper aims to conduct experiments through the design of aerobic training process, in order to let the subjects step by step and efficiently complete the training task, and put forward reasonable suggestions.

1. Introduction

Cross-country skiing is called "snow marathon", is strict with the athletes' physical quality, a good cross-country skiing athletes should have excellent strength, endurance, this needs us pay the hard work and effort, to be in the process of training the combination of aerobic and anaerobic training, the most important is aerobic training, speed, agility and coordination. This paper analyzes the status quo of aerobic training for cross-country skiers, and designs the methods of aerobic training for cross-country skiers, in order to achieve the long-term goal of national sports in China, and promote the faster development of snow sports. With the development of the country, the improvement of living standards, people are no longer limited to live for life, young people began to

try all kinds of new things, cross-country skiing in the sights of everybody at this moment, colleges and universities also offer professional, cross-country skiing but because teenagers weakness exists in the physical quality, cause the cross-country skiing sports ability is insufficient. I hope that through this graduation project, let teenagers use scientific aerobic training methods, improve their physical quality, and strive to improve the cause of cross-country skiing for teenagers. The purpose of this paper is to make the subjects complete the training task step by step and efficiently through the design of aerobic training process experiment, and put forward reasonable suggestions. Quote: Cross-country skiing is called "snow marathon", is strict with the athletes' physical quality, a good cross-country skiing athletes should have excellent strength, endurance, this needs us pay the hard work and effort, to be in the process of training the combination of aerobic and anaerobic training, the most important is aerobic training, speed, agility and coordination. This paper analyzes the status quo of aerobic training for cross-country skiers, and designs the methods of aerobic training for cross-country skiers, in order to achieve the long-term goal of national sports in China, and promote the faster development of snow sports. With the development of the country, the improvement of living standards, people are no longer limited to live for life, young people began to try all kinds of new things, cross-country skiing in the sights of everybody at this moment, colleges and universities also offer professional, cross-country skiing but because teenagers weakness exists in the physical quality, cause the cross-country skiing sports ability is insufficient. I hope that through this graduation project, let teenagers use scientific aerobic training methods, improve their physical quality, and strive to improve the cause of cross-country skiing for teenagers. The purpose of this paper is to make the subjects complete the training task step by step and efficiently through the design of aerobic training process experiment, and put forward reasonable suggestions.

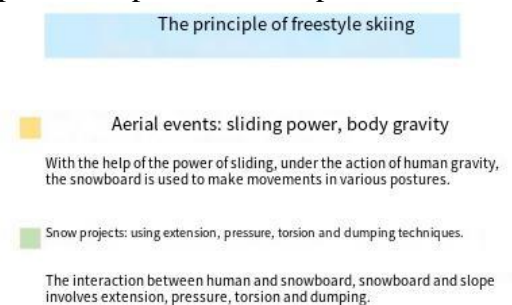


Figure 1. The principle of freestyle skiing

2. Overview of Aerobic Exercise Aerobic Exercise

Aerobic exercise is a mild or moderate exercise that can be sustained over a long period of time by aerobic metabolism to obtain hemoglobin. On the other hand, anaerobic exercise is a kind of high-load exercise in which energy can be temporarily obtained even when the supply of oxygen is strained due to anaerobic metabolism. However, lactic acid, which is an anaerobic metabolite accumulated in the body, is metabolized in the TCA cycle in the same way as aerobic exercise, and therefore has the same metabolism. Aerobic exercise refers to physical exercise in which the human body is fully supplied with oxygen. That is to say, during exercise, the human body inhales oxygen equal to the demand, reaching a physiological equilibrium state. Simply, it refers to any rhythmic exercise with a long duration (about 15 minutes or more) and a moderate or above moderate intensity (75% to 85% of the maximum heart rate). Whether it is "aerobic exercise", the measure is heart rate. Exercise with a heart rate of 150 beats per minute is aerobic exercise because the blood can supply enough oxygen to the heart muscle. Therefore, it is characterized by low intensity,

rhythm and long duration. Exercise for at least 1 hour per session, 3 to 5 times per week. This kind of exercise, oxygen can fully metabolize the sugar inside, can also consume body fat, strengthen and improve heart and lung function, prevent osteoporosis, adjust the psychological and mental state, is the main exercise mode of fitness. Progress in the Study of Aerobic Training in Adolescents has clearly pointed out that the ability recovery training in aerobic exercise refers to the direct or transport of large amounts of oxygen to people during the whole process of aerobic exercise all of his muscles, or those that are directly involved in other aerobic exercises, and absorbing energy directly produced by humans through aerobic metabolism to maintain or help support the activity of these muscle groups in other aerobic exercises. Aerobic exercise physical ability level is an important index for school to measure the physical quality and physical and mental health of students in adolescence.



Figure 2. Various types of aerobic exercise

3. Content of Aerobic Training Control for Cross-Country Skiers

In the process of realizing the training goal, the training regulation plays an important role. Only under the regulation of the training process can the training goal be realized more effectively and quickly. In the process of implementing regulation and control, it is also a process of "correcting deviation", which also ensures that the training plan is carried out in an orderly and complete manner. The content of regulation includes the regulation of training content, the regulation of training load and the regulation of psychological diathesis. Aerobic training relies on glycolysis system and aerobic oxidation system to supply energy from the physiological point of view. On this basis, athletes can be trained under the condition of sufficient oxygen, reasonable arrangement of training intensity, to ensure the scientific and effective results of the study.



Figure 3. Skier scene

3.1. Low Load Stage of Aerobic Training

The low intensity aerobic training stage is mainly to pave the way for the later high-load aerobic training. In this stage, the main training contents include jogging, rapid walking and rope skipping training. A training program lasts at least 15 minutes, with a 5-minute interval and two or three cycles, so that you don't get particularly tired and you can guarantee aerobic training time. The main task is to develop the aerobic training of athletes, and then lay a foundation for the next aerobic training in the middle intensity period. The training characteristics of this stage are mainly characterized by low intensity, while giving consideration to the development of aerobic level.

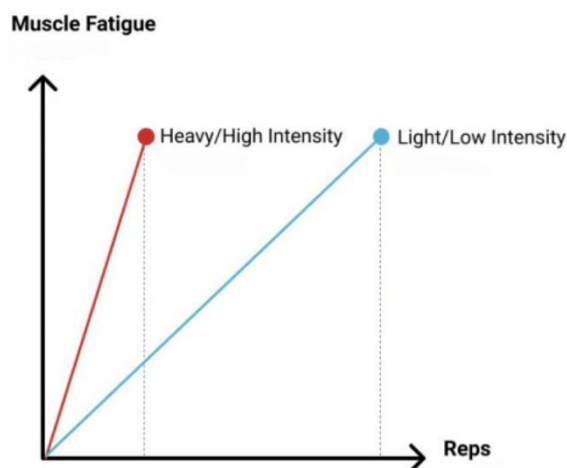


Figure 4. Relationship between muscle fatigue and repetition number in aerobic exercise

3.2. Medium Load Stage of Aerobic Training

Summarize the training effect of athletes in the previous stage, carry out aerobic medium load training. In this stage, the training methods such as fast running, 30 minutes basketball game and short jumping are mainly adopted. These methods can be combined with the low intensity training methods of aerobic training to better develop the aerobic fitness of athletes. Because this stage will focus on the improvement of aerobic level, the training methods are repeated training method, continuous training method, interval training method and change training method. At the end of the training, to fully reduce the deep fatigue caused by aerobic training, the method used includes mutual massage, knocking and relaxation interaction forms. The main feature of this stage of training is that in order to improve aerobic level, the training method of rhythm interval and circulation training will be used, which will transition from low-intensity training to medium-intensity training and gradually increase the difficulty of training.

3.3. High Load Phase of Aerobic Training

In the high-intensity period of aerobic training, the aerobic low-load training and moderate intensity training are used as the foundation to begin high-load aerobic training. The training methods are mainly sprint running, high leg running, side running, backpedal running and push-up. In the training process, the main task is to improve the aerobic physical quality of athletes through high-intensity aerobic training. The training adopts high-interval training, repeated training with many short periods of rest. The cycle training of an action must be guaranteed for more than 30

minutes to ensure the time control in aerobic training. You'll feel out of breath, but it won't tire you out, which translates into an aerobic fitness boost more efficiently by doing high-intensity exercises. At this stage, aerobic exercise performance is characterized by large training load intensity and high efficiency in improving aerobic level, and athletes can efficiently complete the training task at this stage.

3.4. Adjustment and Control of Athletes' Fatigue

The main reason for adjusting and controlling the training content is that some of the more flexible training content can be adjusted and controlled flexibly by observing the trainees during the implementation of the training plan. Control the training content of the trainees in real time, and obtain information in the process of control, timely feedback. The regulation of the training content makes the training process flexible and changeable, which is helpful to improve the enthusiasm of the trainees, improve the all-round control of the trainers, and improve the effectiveness of the training. The adjustment and control reasons of training load mainly start from the students' own bearable physiological load, according to the principle of appropriate load to strengthen the physique and improve the pace speed. Training load can be divided into load intensity and load quantity. It is found that the academic community has different views on the relationship between the two and the classification structure of training load, so it is impossible to determine the standard. According to this design, through Marxist materialist dialectics, we find that there is a connection between things, and the two are both opposite and unified, so we should not only fully consider the load intensity, it is also necessary to consider the load, coordinate development, and control the load to ensure the students' excessive recovery, so as to make the training more scientific and effective. The regulation of psychological quality mainly starts from the psychological health of the students, conforms to the principle of coordinated development of body and mind, and ensures that the training is always carried out along the "people-oriented" road. The psychological quality of students can directly influence the training process and effect, and it is an important part of the effective implementation of training plan to keep students in good psychological state.

Table 5. Changes of various systems of aerobic exercise

Energy supply system	Can maintain the time		output power	Generate the ATP rate	Generate the ATP capacity
system	6-8s		large	fast	little
The glycolytic system	2-3 Points		secondary	secondary	secondary
Aerobic system	sugar	1.5-2h	little	supercilious	large
	fat	--			
	protein	--			

4. Conclusion

In that aerobic train of cross-country skier, in order to better let the athlete master the aerobic training method, the form of multiple feedback is adopted to improve the athlete's training skill mastery, multiple feedback mainly includes the feedback between athletes, coach feedback and video feedback, the purpose is to improve the mastery of aerobic training. By summarizing and analyzing the training process, the subjects can quickly master the aerobic training method. In terms of training quantity and intensity, aerobic training is designed in three stages, and the training

quantity and load in each stage are different. Overall, the training load in the first stage is average. In the second stage, the training volume and load are increased, and in the third stage, the training volume and load are enlarged, which ensures that the subjects are well adapted to the aerobic training load design. In that process of aerobic training, the principle of appropriate load training shall be followed, the composition of exercise load shall be correctly understood, the load measure shall be gradually increased, and the relationship between load and recovery shall be correctly handled. The training content shall be arranged scientifically according to the practical possibility of the subjects and the adaptability law of human body function training. After aerobic training, follow the principle of timely recovery training, timely eliminate the physiological and psychological fatigue generated by the subjects, master the excessive recovery process produced by the biological adaptation process, accurately judge the degree of fatigue and actively take measures.

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Data Availability

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

Conflict of Interest

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

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