

# Research on the Training Strategy of Endurance Quality of Middle and Long Distance Runner

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**ABSTRACT.** *in the modern middle and long distance running training, endurance quality training is a very important content. Strengthening the endurance quality training of middle and long distance runners can not only improve the effect of special technical training, but also improve the willpower of athletes, such as perseverance and never give up. This paper first briefly introduces the significance of endurance quality training for middle and long distance runners, and then analyzes the methods of endurance quality training for middle and long distance runners. The purpose of this study is to improve the understanding of coaches and middle-distance runners on endurance quality training and provide some references for coaches to carry out endurance quality training for middle and long distance runners scientifically.*

**KEYWORDS:** *Middle and long distance running, Endurance quality, Physical training*

## 1. Introduction

Compared with sprint, the middle and long distance running has long distance, long time and large physical consumption. Only with strong endurance quality can the athletes complete the middle and long distance running with high quality. Endurance quality is the physical ability of individuals to overcome their fatigue in long-time work and exercise. From the perspective of physiology, endurance training can improve the physiological functions of the nervous system, respiratory system and blood circulation system of middle and long distance runners, and improve the physiological functions related to the special technical movements of middle and long distance runners. At the same time, endurance training can also improve the anti-fatigue ability of middle and long distance runners. Because of endurance training, athletes' movement speed, reaction speed and sensitivity will decrease<sup>[2]</sup>. In other words, endurance training improves the endurance quality of middle and long distance runners while greatly reducing the degree of reduction in other qualities of athletes, which can give full play to the effects of various qualities. In addition, due to the long duration and high physical consumption, endurance

training requires athletes to maintain specific exercise intensity and quality for a long time during the training period, so it can cultivate the quality of perseverance and never give up.

## **2. Training Methods of Endurance Quality for Middle and Long Distance Runners**

It can be seen that endurance training has a significant role in promoting the development of physical fitness, economic ability and will quality of middle and long distance runners. Therefore, coaches should pay attention to the endurance training of middle and long distance runners. Combined with personal teaching and training experience, it is considered that coaches can adopt the following training methods to develop the endurance quality of middle and long distance runners.

### ***2.1 Interval Training Method***

The so-called interval training method means that the coach requires the middle and long distance runners to complete a systematic training, after a certain interval of recovery, under the condition that the athletes body has not been fully recovered, then the athletes are required to carry out the next training. The proper use of interval training requires the coach to accurately grasp the time when the athlete's body is fully recovered, and cannot wait until the athlete's body is fully recovered before organizing training. Usually, coaches can judge whether their body is fully recovered by the recovery of the athlete's heart rate. Due to the incomplete recovery of the body of the athlete, there will be very obvious accumulation of fatigue in the next training<sup>[3]</sup>. Interval training aims to control the athlete's exercise intensity to make the athlete's body adapt to the exercise intensity, thereby improving the acid resistance of the muscles. A lot of training practice has proved that interval training is an effective way to develop the endurance quality of middle and long distance runners.

### ***2.2 Continuous Training Method***

The so-called continuous training method refers to the training method in which the coach continuously allows the middle and long distance runners to exercise at a fixed exercise intensity. Continuous training has a long duration, so its exercise intensity is low. The continuous training method has a continuous stimulating effect on the body of middle and long distance runners. Although the intensity of continuous training is low, there is no obvious recovery interval during the training process, so the overall training load is also relatively large. Because the intensity of exercise in the process of training is usually fixed, so the cumulative stimulation to the body of athletes is relatively mild. Generally, the heart rate of middle and long distance runners in the process of continuous training is 140-160 beats/min, while that of excellent athletes is 160-170 beats/min. In the actual training, the coach can adjust the duration and exercise intensity flexibly according to the endurance quality

of the athletes, but it is necessary to pay attention to the inverse relationship between exercise time and exercise intensity. If the exercise intensity is large, the exercise time should be shortened appropriately. On the contrary, it is appropriate to extend the exercise time.

### ***2.3 Repetitive Training Method***

The so-called repetitive training method refers to a method that coaches guide middle and long-distance runners to carry out repeated training after ensuring the complete recovery of athletes' body under the condition of relatively fixed movement mechanism and exercise intensity and according to the determined recovery interval time. The characteristic of repetitive training method is that the middle and long distance runners repeat several fixed marked sections. The repetitive training method requires that the middle and long distance runners recover completely after every repetition. This training method can significantly improve the physical function of middle and long-distance runners, allowing the athletes to gradually adapt to the exercise intensity<sup>[4]</sup>. Repetitive training is closer to the official competition than interval training, so it is more likely to cause athletes to fatigue. At the same time, repetitive training is a very boring and single training process, so it is more likely to make athletes feel boring. In this regard, coaches should pay more attention to the athletes' recovery interval, while using more vivid and humorous language and body movements, and incorporate some sports games, so that the athletes maintain a positive and optimistic attitude.

### ***2.4 Altitude Training Method***

The so-called altitude training method refers to a method by which coaches can take full advantage of the low level of oxygen at altitude to allow middle and long-distance runners to train under hypoxia environment. The quality of endurance training for middle and long distance runners is affected by environmental factors, such as climate, temperature, and terrain<sup>[5]</sup>. For example, middle and long distance runners who train in a high temperature environment will increase their metabolism, blood flow rate and water loss rate. In this temperature training, athletes must be timely replenishment of water. Studies at home and abroad have shown that altitude training can increase the amount of hemoglobin and blood volume of middle and long distance runners, and can make middle and long distance runners better exercise their own functions, especially the respiratory system and blood circulation system<sup>[6]</sup>. Compared with the plain, the plateau terrain is high and the oxygen is thin. Altitude training can significantly improve the anaerobic endurance ability of middle and long distance runners, so as to improve their endurance quality.

### ***2.5 Natural Running Training***

The so-called natural running training method refers to the training method in which the coach makes use of the congenital geographical environment conditions,

such as mountains, forests, hills, etc., to let middle and long distance runners freely switch running speed within the specified time<sup>[7]</sup>. Although altitude training is located on the plateau, its training venues are mainly track and field fields established in the plateau area. Athletes rarely go to the plateau environment outside the training area for training. The natural training method takes the rich terrain in the nature as the training field, and is close to the nature. It can make the athletes feel the colorful nature during the training, and make the athletes feel happy and not feel tired.

### 3. Conclusion

Endurance is one of the important physical qualities that middle and long distance runners need to possess. In training practice, coaches can develop the endurance quality of middle and long-distance runners through interval training, continuous training, repetitive training, altitude training and natural running training. Considering that after a period of endurance training, the phenomenon of “poles” will appear in middle and long distance runners, the coach should regularly evaluate the endurance of the athletes, and then adjust the exercise load in the endurance training according to their actual endurance quality. In this progressive training process, the endurance of middle and long distance runners can be constantly improved.

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