

A Study of a New Marathon Stretching Exercise Based on the Traditional Chinese Sports Regimen with Dao Yin

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Abstract: As an exercise system mainly characterized by stretching, the traditional Chinese sports regimen with Dao Yin is a treasure of Chinese traditional culture, which has the characteristics of "three tuning in one" between body, breath, and mind, and is an effective way to maintain health and health care. The application of traditional Chinese sports regimen with Dao Yin to the new marathon stretching exercises is a unique way to reduce the occurrence of marathon injuries. Based on the current development of modern marathon stretching exercises and the characteristics of Dao Yin, this paper illustrates the feasibility, superiority and innovation of applying Dao Yin to new marathon stretching exercises, and creates a new set of marathon stretching exercises with high application value.

1. Introduction

There has been a boom in mass sports and a "marathon craze" in recent years, however, this has been accompanied by a high incidence of sports injuries. The growth of amateur players may have contributed to the increase in the accident rate. According to the literature, correct and effective warm-up stretching before and after running can effectively avoid the risk of injury[1].

Traditional Chinese Medicine (TCM) regimen with Dao Yin is a kind of healthcare technique characterized by systematic stretching movements[2]. It belongs to the category of traditional national sports but is also an important component of TCM health culture. With its diverse contents and forms, Dao Yin integrates healing, fitness, and health care, and is an important carrier of medical and physical integration. Guided by the theory of essence, qi, blood, yin and yang, internal organs, and meridians, Dao Yin can improve the body and mind, stimulate one's own anti-disease and healing functions, and maintain and enhance the state of health through the subjective and active stretching of limbs, breathing, and psychological conditioning[3]. Applying Dao Yin for pre-race stretching and post-race relaxation may help to reduce the risk of injury to participants and contributes to the sustainability of the marathon.

2. The Current State of Modern Marathon Stretching Exercises

Stretching exercise is essential to the pre-race warm-up preparation and post-race relaxation

activities for marathon sports. Scientific and effective stretching before the race can improve muscle elasticity and stretching, increase joint mobility, and reduce muscle viscosity[4] , which helps to improve sports performance and reduce the risk of sports injury. And targeted stretching and relaxation after the race can promote body recovery and avoid the accumulation of injury and sports fatigue. Unscientific and inadequate pre- and post-run stretching can lead to sports injuries. Although stretching exercises are useful to avoid marathon injuries, they are not used to a great extent in practice. Some surveys show that the majority of amateur marathon participants do not warm up before the race and do not relax afterward[5] which correlates with the occurrence of sports injuries. Other surveys revealed that muscle strain was the main type of injury among amateur marathon runners, accounting for 58.8% of the total; and inadequate warm-up and improper stretching before the start were the main causes of injury[6].

Currently, Marathon stretching exercises are mainly aimed at the lower limb and hip muscle groups, and the mainstream stretching ways include static stretching, dynamic stretching and PNF(Proprioceptive Neuromuscular Facilitation) stretching. Static stretching is a single-joint, single-muscle group and single-plane stretch that involve slowly pulling the muscle tissue to a certain level and pausing for some time to give the muscle the best lengthening effect. Dynamic stretching is a multi-joint, multi-cluster, and multi-planar stretching warming-up method that allows the muscles to reach their peak of stretching for a short period through rhythmic repetitive movements, allowing the body to move quickly, comprehensively, and fully. PNF stretching employs proprioceptors to regulate muscle contraction or relaxation to achieve a stretching effect. Static stretching is often applied in marathon pre-race preparation and post-race relaxation, which can reduce muscle stiffness, enhance body flexibility, increase range of motion, and help improve muscle stiffness and soreness due to high-intensity, prolonged exercise [7], which can reduce the incidence of sports injuries. PNF stretching is often used in marathon preparation to better stretch the deeper muscles and ligaments of the body, which is superior to static stretching in improving flexibility[8]. Dynamic stretching is often used in conjunction with static stretching to warm up before a race and has certain advantages in improving muscle explosive power, coordination, and muscle sensitivity.

However, studies have shown that static stretching and PNF stretching are detrimental to athletic performance: static stretching may affect muscle strength and explosive power; PNF stretching may have a negative impact on improving maximum excitation explosive power, etc[9]. In addition, other studies have shown that there is a risk of muscle strain in dynamic stretching movements with large amplitude and intense stretching, and unreasonable dynamic stretching can cause muscle stretch reflex, reduce muscle strength, muscle fatigue, soreness, and other phenomena, and can even cause muscle injuries[10]. How to handle the optimal sequence of stretches and how to apply them efficiently in preparation or finishing activities, in order to maximize their value and avoid their negative effects, is a problem that needs to be solved in modern stretching exercises.

3. Feasibility Study on the Application of the Traditional Chinese Sports Regimen with Dao Yin to Marathon Stretching Exercises

3.1. Overview of Dao Yin

Dao Yin originated from the practice of ancient people, and its application has a long history. As early as prehistoric times, people invented the "dance" to promote emotion, relax the muscles and bones, and solve the pain of paralysis, rheumatism and swelling, and this "dance" is considered to be the germ of Dao Yin. The term "Dao Yin" was first seen in the Zhuangzi Keyi "Blowing and breathing, exhaling the old and nurturing the new; stretching like the bear and bird,that is the practitioner of Dao Yin" which is a reflection of the early Dao Yin of breathing and limb movements in conjunction with each other. In the Nei Jing, here is the record that "In central

region..... Most diseases that occur here are impotence, syncope, cold and heat, and the treatment is suitable for Dao Yin and massage", which shows that Nei Jing has included the Dao Yin as a medical treatment. Dao Yin became popular as early as the Spring and Autumn and Warring States periods, and it was valued by medical practitioners and diviners of the time. Through the development of various dynasties, the content and form of the Dao Yin became more and more refined, from the simple form of "dance" to the Dao Yin with the body and breathing in coordination, and from unsystematic movements to the complete sets of movements such as Ba Duan Jin and Yi Jin Jing.

As a kind of sports regimen technique that has been handed down from ancient to modern times, Dao Yin has a high value that has been proven by health practitioners, medical doctors, and people throughout the ages. A large number of current studies have shown that the practice of Dao Yin has a positive effect on the circulatory system, the motion system, the respiratory system, the immune system, and other healthy functions [11].

3.2 Dao Yin is an Exercise System Characterized by Stretching.

As a systematic stretching exercise, Dao Yin includes two elements: Dao Qi and Yin Ti. Dao Qi means a breathing exercise under the guidance of consciousness, while Yin Ti means stretching the limbs and moving the muscles and bones. It can be considered as a subjective and active stretching exercise that integrates breathing regulation and limb stretching. Research has shown that[12] stretching can increase muscle strength, promote muscle development, improve movement coordination and reduce fatigue to avoid sports injuries. Reasonable preparatory activities before exercise can activate the nervous system and wake up the muscles, increase the amount of capillary opening in the muscles, allowing the muscles to be more flexible and elastic, at the same time, can even stretch the ligaments, making the body more synovial fluid in the various joint cavities, thus effectively preventing sports injuries in the joints and muscles[13]. Dao Yin is not only limited to the movement of the limbs but also focuses on the coordination between the various functions of the human body. It is through breathing and exhalation that makes the breath in the body harmonious, and then with the limb's traction movements, so that the limbs exercise more flexibly, and strongly. Studies have shown that the practice of Dao Yin has positive significance in improving the muscle strength of the knee flexor group and the ratio of the peak moments of the flexor and extensor muscles, which could prevent and improve the stability of the knee joint due to muscle weakness of the lower limbs[14].

The very important feature is that core of the methodological approach of Dao Yin is harmony and moderation, focusing on overall regulation. Practicing a set of targeted Dao Yin exercises before running a marathon, on the one hand, can effectively stretch the muscle tissue, improve the body's flexibility, enhance the body's blood circulation and metabolism, and make the body slightly warm which reduces the viscosity of the muscle tissue and improves the stretching and elasticity, thus helping to improve the athletic ability and prepare for the next long-distance endurance run. On the other hand, Dao Yin has the characteristics of "guiding qi to make harmony, guiding the body to make flexibility", which can effectively avoid muscle damage caused by over-stretching or improper stretching in modern stretching exercises while improving body flexibility and coordination, and reduce the unfavorable factors affecting the performance of the competition. In addition, Dao Yin can also be applied as a relaxation exercise for the participants' post-race body adjustment, speeding up muscle recovery and reducing the occurrence of muscle cramps and strains after marathon races, meanwhile, the acceleration of blood circulation is conducive to the recovery of electrolytes, enzymes and nutrients in blood and muscles and the discharge of metabolic wastes such as lactic acid from endurance sports.

3.3 The "Holistic View" of Dao Yin

Based on the concept of "Form, Breath and Spirit", the integration of the "adjusting body, breath and mind" is the intrinsic characteristics and essence of the technique, reflecting the holistic concept of Chinese medicine. Adjustment of the body is manifested in the posture of the practice, that is, relaxing the body with the form upright and loose, and consciously controlling the posture and movement of the body, rigidly and flexibly, loosely and unremittingly, so that the flow of qi and blood become smooth. Breath adjustment refers to the regulation of breathing activities, or the exercise of breathing, which requires going with the flow of nature and gradually adjusting the breathing softly, evenly, and slowly under the control of the mind. At the same time, the exhalation of the old and the new can promote the accumulation and operation of vital energy in the body, harmonize qi and blood, and balance yin and yang. Adjusting the spirit is also known as guarding the will, and the exercise of the mind needs to exclude distractions, focus on concentration with less thinking and less desire, and nourish the temperament. And then calm the mind at the same time to lead the Qi to regulate the flow of Qi and blood[15]. The three main points of Guiding Technique practice are "Form is upright", "Breath is smooth" and "Mind is peaceful", and the three are interrelated and affect each other. Traditional Chinese medicine holds that "only when the form and the spirit are in harmony can one enjoy the fullness of one's life". The qualities of the "three tunings in one" of the Dao Yin all reflect the TCM concept of harmony between form and spirit.

Compared to modern stretching exercises, Dao Yin focuses on the coordination of breath and intention, which is its greatest advantage. Contemporary scientific research proves that the regulation of breath can regulate the tension of sympathetic and parasympathetic nerves in the autonomic nervous system, thus adjusting the functions of the corresponding visceral tissues and organs[16]. To regulate the mind is to focus on the circulation of one's own qi and blood when one is awake and subjective, which helps to eliminate distractions, reduce consciousness and external activities, and smooth the flow of qi and blood, resulting in a sense of pleasure and relaxation. Athletes' emotions are one of the most important factors affecting their competition performance, and a poor mental state can lead to sports injuries.[17]Practicing Dao Yin before marathon running, can help improve the performance of participants by regulating negative emotions such as tension and anxiety while stretching the muscles. At the same time, the "mind regulation" effect of Dao Yin can exercise the concentration of athletes and reduce the accidental marathon accidents caused by off-field factors that distract the participants' attention.

4. A New Marathon Stretching Exercise Based on the Traditional Chinese Sports Regimen with Dao Yin

Dao Yin has a certain fit with modern marathon stretching exercises but is better than modern marathon stretching exercises. Gentle and moderate stretching movements can improve flexibility and coordination, while effectively avoiding muscle damage caused by overstretching or improper stretching in modern stretching exercises, meanwhile, it has the characteristics of the overall regulation of the body, breathing, and mind. Based on the characteristics and advantages of Dao Yin, we have created a new set of marathon stretching exercises with the following movements:

Prep: Feet are shoulder width apart, hands hang naturally on the side of the body, eyes forward, adjust breathing.

Segment 1 Neck Stretch

①Cross your arms behind your head, slowly lower your head, stretching to the maximum, and stay for four eight beats.

②Place your thumbs against your chin and lift your head upward, stretching it to its maximum and holding it for four eight beats.

③Raise your left hand to your right ear, tilt your head to the left, and slowly lower your right hand, staying for four eight beats.

④Raise the right hand to the side of the left ear, tilt the head to the right, and slowly lower the left hand for four eight beats.

Segment 2 Upper body stretching

①Place the left forearm on the right elbow joint, bend the right hand, and stretch to the right.

②Straighten the left arm forward, palm facing forward, hold the left palm in the right hand and stretch backward, stay for four eight beats.

③Straighten the left arm upward, hold the left palm with the right hand and stretch downward, stay for four eight beats.

④Fold down the left arm, hold the left elbow joint with the right hand, and stretch to the right side, stay for four eight beats.

Repeat the first four movements in the opposite direction.

Segment 3 Waist Stretch

①Cross your feet, place your right foot in front of your left foot, extend your right hand down to the left, raise your left hand straight arm up, tilt your body to the right, stay for four eight beats.

②Repeat in the opposite direction.

Segment 4 Lower limb stretching

①Feet shoulder-width apart, bend your body at 90 °, extend both arms forward and stay for two eight beats.

②Place your left hand on the toe of your right foot, extend your right hand upward, look at the fingertips of your right hand, and keep your hands in a straight line for four eight beats.

③Repeat in the opposite direction.

5. Conclusions

Dao Yin is the crystallization of the wisdom of Chinese sports and health care, as a kind of systematic stretching exercise with the effect of regulating body, breath and mind. Its stretching feature helps to activate all joints as well as muscles, fully stretching all muscles of the body, which helps to relieve muscle tension, improve the adaptability of the body and reduce the occurrence of sports injuries. The characteristics of overall regulation, harmony and moderation, and physical and mental harmony are its competitive edge, and it has certain superiority compared with modern stretching exercises. The introduction of Dao Yin into marathon events, creating new marathon stretching exercises based on Dao Yin has a high application value, which can effectively target the muscle groups used in marathon sports, at the same time ease the tension before the race, which can effectively prevent the risk of injury, reduce the occurrence of marathon accidents. Meanwhile, the combination of Dao Yin and marathon stretching exercises is also an inheritance and innovation of traditional Chinese sports regimens, which effectively promotes the sustainable and healthy development of traditional Chinese sports regimens.

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