

TCM diagnostics for injury prevention in Mid/Long-Distance runs

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Abstract: The middle and long-distance running event in the "College Students' Physical Health Standards" test has the effect of enhancing students' willpower, expressiveness, and social adaptability. However, injuries are highly likely to occur during the middle and long-distance running, which can cause physical harm and mental pressure to schools, teachers, parents, and students, and affect the authenticity of the test results. The "Four Diagnostic Methods" of Traditional Chinese Medicine (TCM) are treasures of our country's traditional medical culture. By utilizing the rich theories and experiences of TCM's "Four Diagnostic Methods" to explore the hidden dangers that lead to sports injuries, it is possible to prevent injuries in middle and long-distance running at an early stage and reduce the occurrence of sports injuries.

Keywords: Four Diagnostic Methods, Physical Fitness Test, Middle and Long-Distance Running, Sports Injuries

1. Introduction

The renowned "Four Diagnostic Methods" in Traditional Chinese Medicine (TCM) determine the state of the human body based on the phenomena of excess and deficiency. By observing the external features to infer the disease, listening to the five sounds to differentiate the condition, inquiring about the patient's preferences for the five flavors to understand the illness, and feeling the pulse to know the disease, TCM practitioners discover issues, identify the causes, and cure diseases through observation, listening, inquiry, and palpation. In the "College Students' Physical Health Standards," the middle and long-distance running items in the physical fitness tests are beneficial for improving students' cardiovascular and respiratory functions, enhancing the ability to resist diseases, and cultivating a strong will. However, sports injuries often occur during the middle and long-distance running tests, such as ankle sprains, sports falls, and abrasions. [1] The occurrence of sports injuries can bring economic, mental, and physical harm to parents, teachers, students, and schools. How to prevent the occurrence of sports injuries has become a matter of concern. The "Four Diagnostic Methods" of TCM are simple and practical. During the middle and long-distance running process, organizers can use observation, listening, inquiry, and palpation to understand the students' sports condition and detect the early signs of injury in time, preventing injuries before they occur, and reducing the chances of sports injuries, thus allowing the physical fitness test to play its maximum role.

2. TCM's four diagnostic methods

The human body is an organic whole, with the viscera at its core and the meridians interconnecting it. The five viscera correspond externally to the skin, flesh, vessels, tendons, and bones, as well as the ears, eyes, mouth, nose, and tongue. [2] Traditional Chinese Medicine's "Four Diagnostic Methods" refer to the process of examining and collecting information about diseases through observation, auscultation and olfaction, inquiry, and palpation. It involves inferring the condition of the viscera, qi, and blood circulation, and the vitality of life, through changes in one's complexion, pulse, skin, demeanor, posture, speech, and movement. [3] Visual diagnosis in TCM uses sight to observe the patient's complexion, form, movement, five senses, tongue appearance, secretions, and excretions for a purposeful understanding of the condition; auscultation and olfaction diagnose by the sounds of the patient's speech, breathing, and the odors of

excretions and breath; palpation involves feeling the pulse and pressing other parts to detect internal and external changes; inquiry involves questioning the patient or their family to understand the patient's desires, likes, dislikes, health status, causes of illness, course of disease, and self-perceived symptoms to grasp the cause of the disease. TCM diagnosis emphasizes the integration of the "Four Diagnostic Methods." As stated in "Su wen - The Great Treatise on Yin and Yang," "A good diagnostician observes the color, feels the pulse, first distinguishes yin and yang; examines the clarity and turbidity to know the parts, observes the breathing and listens to the voice to know the suffering, observes the balance and rules to know the main disease; presses the size, observes the floating, sinking, smooth, and rough, and knows where the disease originates. In treatment, there is no fault, and in diagnosis, there is no mistake.

3. Preventing injuries in Mid/Long-Run tests with TCM diagnostics

3.1. Meticulously detailed and comprehensive observation

Traditional Chinese Medicine's "observation" diagnosis involves identifying abnormalities through observing the spirit, complexion, form, head and neck, five senses and nine orifices, tongue, and excretions and secretions. Observation holds a special place in TCM diagnosis. Studies have shown that about 80% of the information people receive comes from vision. Making full use of vision and honing keen observational skills are aspects that physical education teachers should focus on improving in their daily teaching work. During testing, testers fully utilize the function of their eyes, understand the safety of the testing environment, the scientific nature of the testing methods and processes, and the physical and mental state of the students through careful and comprehensive observation. By "observing" and mastering the details and identifying potential safety hazards, a preventive approach can be taken.

3.1.1. Observe the testing environment

The environment directly affects students' health and the occurrence of injuries. Adverse weather and poor sports facilities can lead to sports injuries. For example, smog can cause acute rhinitis and acute bronchitis, easily trigger the onset of cardiovascular diseases, exacerbate the condition of sick students or cause acute episodes, and when the fog is dense, the high moisture content makes it difficult for sweat to evaporate during outdoor activities, which can easily lead to chest tightness, increased blood pressure, and other adverse reactions. Smoggy weather has weak light and low air pressure, which can easily make students feel mentally lethargic, emotionally down, and even pessimistic and disappointed, which is not conducive to students' health and creates a breeding ground for sports injuries. Hidden safety hazards such as damaged venues, uneven ground, and damp surfaces will increase the chances of sports injuries. Before testing, observe the weather and conduct tests on sunny days. Do not carry out tests in severe smog, low air pressure, scorching sun, or biting cold. Before testing, organize the venue to ensure the ground is flat without damage, and ensure it is clean and free of foreign objects.

Observe the preparation for the test. Check if there are medical personnel on site, whether supervisors are in place, and if the equipment is properly prepared. Do not take action rashly without a doctor, do not start without supervisors, and do not test without complete equipment.

3.1.2. Observe the students' condition

Observing the students' condition mainly involves close and subtle observation to capture the nuances of the students' expressions, movements, and demeanor to assess their physical and mental states, thereby taking preventive measures to reduce the occurrence of sports injuries.

By observing their complexion and posture, one can understand the students' physical and mental conditions. Early detection of potential safety hazards can be achieved through such observation. A person's spirit is most genuine when it is unconsciously revealed. Before starting the test, carefully observe the students' gaze, demeanor, speech, facial expressions, and body posture to get an idea of their physical and mental state. For example, bright eyes, proper behavior, natural expressions, and a relaxed demeanor are signs of good condition; whereas drowsy eyes, pale complexion, exaggerated movements, and nervous expressions indicate poor condition. Pay more attention to or inquire about those who appear to be in poor condition.

Observe whether the preparation is adequate. At the testing site, "observation" can be used to understand if the students have organized preparatory activities or if they are sufficient; "observation" can be used to judge whether the subjects to be tested are dressed appropriately and whether they are wearing any accessories that may cause injuries; "observation" can be used to detect any chasing, fighting, and prevent excessive behaviors; "observation" can be used to understand if the students' mental state is overly excited or poor. By observing, one can know the basic conditions of the students before exercise, and if there are any unreasonable issues, one should remind and correct them in time to prevent insufficient preparation from causing injuries or excessive excitement or mental depression leading to sports diseases. Through observation, one can prevent minor issues before they become serious, and nip sports injuries in the bud.

Observe if there are any changes during the exercise process, understand the body, spirit, and posture by observing. The exercise process is long, and attention should be paid to the changes of each student on the field. Middle and long-distance running are team events. At the beginning, observe whether there is any crowding on the field, the possibility of a stampede, and timely detection and guidance; observe the facial expressions of each student on the field, such as those with pale or overly red faces, and timely remind and comfort them to prevent the situation from deteriorating; observe their posture and pace, such as if they appear to be stepping on cotton or in a mud pit, and provide timely guidance and help; observe their breathing and demeanor, such as expressions of pain or shortness of breath, and inquire or assist in time to prevent emergencies. Observe their eyes, "the eyes are the officials of the liver, the envoys of the heart, and the meeting place of yin and yang," the eyes "are bright if the spirit is full, and dark if the spirit is lacking." By observing, one can know the state of exercise, detect problems, grasp the situation on the field, and prevent sports diseases from occurring during the exercise process.

Pay attention to the signs at the end, and do not ignore the students' actions after exercise. By observing, one can grasp the students' exercise reactions and understand their recovery situation. Observe whether there are students on the field with unsteady steps, falling over, shortness of breath, haggard complexion, lying on the ground, and extreme pain, and promptly observe and deal with them to prevent sports injuries from occurring after the run ends. After the end, one should also "look back" on the testing process, summarize lessons and experiences, refine each step, and prevent the recurrence of the same mistakes.

3.2. Listening requires a dual approach and patience

"Su wen - The Great Treatise on Yin and Yang" states, "By observing breathing and listening to sounds, one can understand the suffering of the illness." Listening refers to the use of the ears and nose to understand the patient's condition through the sounds of speech, language, breathing, coughing, vomiting, etc.; and to understand the disease through the smell of breath, sweat, and body odor. The tester fully utilizes the functions of the nose and ears, by smelling the odors to know the disease, listening to the communication to know the heart, and listening to the sounds to know the condition. [4-5]

3.2.1. *Smell the odors to understand the situation*

In Traditional Chinese Medicine, odors can generally be categorized into the odors of the sick body, the odors of body cavities, the odors of excreted materials, and the odors of the sickroom. In physical fitness testing, smelling odors mainly involves the odors present in the testing area, the odors from the students' body cavities, and the odors emitted by the body. The testers fully utilize the sense of smell to detect the freshness of the air before testing, to determine if there is any pungent odor, if the wind speed is too high, or if the air is too cold. Based on this, they judge whether it is suitable for testing and make corresponding safety reminders and preventive measures. Before exercise, they smell the atmosphere among the students, comfort and guide those who are extremely excited or afraid, especially to clear the aggressive "gunpowder" smell from male students to prevent fighting and brawling, to prevent losing oneself in a competitive spirit, and to prevent self-harm due to overreaching ambitions; they also smell any special odors emitted by the students, such as bad breath, body odor, or any peculiar smells, such as a fishy, rotten, or strong smell, which may indicate the presence of a disease. Attention or inquiries about the students' physical condition are given to those emitting odors like body odor or special fragrances to prevent sports injuries.

3.2.2. *Listen to their words to understand their hearts*

"Speech is the voice of the heart," so it is important to listen more to what students say. Listening should be comprehensive, as the saying goes, "By hearing both sides, one sees clearly; by hearing one side, one is in the dark." Students who take tests when they are overly competitive, excessively excited, unhappy, in poor spirits, or feeling unwell are prone to achieve results that are not genuine or may cause sports injuries. Teachers should learn to listen, fully utilize the function of their ears, listen to both the students' own thoughts and the evaluations given by their classmates; understand the students' health conditions as well as their family medical history; listen to the students' opinions on the venue, testing methods, and procedures, and also to the changes in the students' own moods; be aware of the students' voices off the field and their cries for help on the field. By listening comprehensively, one can identify the problems and provide different "prescriptions" for each issue.

By listening, one can understand the students' basic conditions and their inner voices, grasp their fundamental mental states, and make reasonable and humane decisions. Before exercise, provide detailed explanations for students with half-understood matters, write exemption applications for those with illnesses in a timely manner, adjust the testing time for those with menstrual pain, and delay the testing time for those who have just eaten. Do not respond carelessly to students' applications or act hastily to avoid situations where students who cannot participate or are unwell are forced to test, reducing the likelihood of injuries; during the exercise, carefully listen to the expressions of students on the field, pay attention to those who signal stomach pain, difficulty breathing, or general weakness to prevent injuries caused by neglecting details. After the exercise, promptly and attentively listen to the verbal and physical expressions of students who feel unwell, do not let the noise of nature cover the weak and faint voices, and at the same time, judge the students' speech, speed, and tone, pay attention to those who speak weakly, and listen quietly to the heartbeats of students who feel unwell in a timely manner, provide timely resuscitation and help to severe cases, and prevent the recurrence of diseases and the occurrence of sports injuries due to neglecting to listen.

3.2.3. *Listen to the sounds to understand the condition*

During exercise, the sounds of speech, footsteps, breathing, and heartbeats can all reflect the students' physical and mental states. If the speech is clear, loud, and fluent, the footsteps are light, strong, and rhythmically distinct, the breathing is steady, deep, and alternating between the nose and mouth, and the heartbeat is moderate and controllable, it indicates a good condition. However, if there is a disorder in the steps with uneven weight, if the breathing is rapid and short through the mouth, and if the heartbeat intensifies and becomes uncontrollable, adjustments need to be made; otherwise, there is a high risk of sports injuries occurring.

3.3. **Ask to be concise and to the point, with mastery of technique**

In "Medical Unification of Past and Present," the sage Sun once said, "Ask before diagnosing, which is the most accurate." [6] "Medical Law of the School, On the Discussion of Asking about Illness" "..., if you do not ask in detail and hastily and recklessly prescribe, wouldn't it harm people?" In Traditional Chinese Medicine (TCM), "inquiry" is a method where the physician learns about the onset, development, treatment process, current symptoms, and other conditions related to the disease by asking the patient or the accompanying person to diagnose the illness. Inquiry is a direct method of understanding others, but "asking" requires mastery of skills. It should be guided by the concept of "holistic view, sincere in emotions, treating others as oneself," and be sincere, good at asking, and clever in questioning. The questions should be straightforward yet simple to answer, achieving the purpose while making students willing to respond.

3.3.1. *Pre-exercise inquiry*

The inquiry should be purposeful. Before exercise, cast a wide net to understand the overall situation of the group, and ask if they understand the process and have mastered the testing methods. For those tested in the morning, ask about their meal times. Take corresponding measures for students with illnesses, those who haven't had breakfast, or those with short meal times; specifically inquire about students with special circumstances before exercise, such as those who are eager and excited, those with drowsy eyes and dull gaze, those with disheveled hair and untidy clothes, or those who are huddled in a corner and appear lethargic, to prevent overexcitement, malnutrition, lack of physical strength, poor sleep leading to excessive fatigue and physical overdraft. At the same time, encourage and guide students to ask questions, and respond

enthusiastically to their inquiries in a timely manner, to prevent a chaotic testing process and the occurrence of related issues or diseases such as disease recurrence, indigestion, abdominal pain, or poor mood due to teachers not asking and students not speaking.

3.3.2. Targeted inquiry during exercise

Inquire promptly about students who exhibit abnormalities during exercise, and follow up with those who show signs of abnormality as detected by observation and listening. Ask students who have pale or bluish faces, feel dizzy, are unsteady on their feet, are pressing their abdomens, or are breathing rapidly. Help them through difficulties with reminders, comfort, and assistance to prevent the condition from worsening. If the situation is severe, make timely adjustments to prevent fainting or more serious consequences.

3.3.3. Prevent oversights after exercise

Inquire promptly after exercise, especially about students who are unusually quiet and lying still. Ask how they feel and what their sensations are. If they report discomfort, arrange for students or teachers to take care of them in a timely manner. In severe cases, seek medical assistance to prevent neglecting the seriously ill who are quiet while only paying attention to those who are loudly vocalizing.

3.4. Identify the crux of the issue, hit the nail on the head

Traditional Chinese Medicine's "palpation" diagnosis includes pulse diagnosis and touch diagnosis. Pulse diagnosis is the act of feeling the pulse, while touch diagnosis involves understanding the internal changes of the disease or the reactions on the body surface through touch, feel, press, and support of the patient's body, thus obtaining diagnostic information for syndrome differentiation. Testing teachers can experience the venue and equipment firsthand to determine if they are reasonable, understand the students' exercise load by feeling their pulse, and understand the students' exercise state through touch, press, and support.

3.4.1. Personal immersion

By palpation, one can understand where the dangers lie and grasp the true situation. Before exercise, personally experience the quality of the venue and the air, the speed of the wind; experience the testing process to check if the venue is slippery, if the equipment is timing correctly, if the placement of the machines is reasonable, if the space is sufficiently large, and if the lighting is scientifically adequate. Discover and solve problems in advance to prevent students from being injured due to issues with the venue or climate.

3.4.2. Palpate the pulse

"Huangdi Nei Jing" (The Yellow Emperor's Classic of Medicine) states, "Subtleties lie in the pulse, which must not be overlooked." [6] The normal pulse, known as a 'ping mai' in ancient times, has a characteristic form of three steps with one breath and four beats per breath (with a leap to five beats per breath, equivalent to 72-80 beats per minute), which is neither floating nor sinking, neither large nor small, calm and gentle, soft and strong, with a consistent rhythm. Generally, a pulse rate of 60 beats per minute is considered slow, and over 90 beats per minute is considered rapid. [7] Before exercise, palpate the pulse collectively by having students press their own pulses for a minute to determine if it is normal. Students with abnormal pulses should be retested or assessed by a doctor. Those with significant deviations in pulse should be granted exemptions or deferrals for exams to reduce the occurrence of injuries. During exercise, through observation, listening, and inquiry, students with abnormal conditions should have their pulse checked. Calm and seek timely medical attention for students with excessively rapid pulses. After exercise, based on specific circumstances, track and supervise students who feel unwell, and if necessary, palpate the pulse and heartbeat, especially pay attention to supervising students who are overly excited to prevent being misled by superficial appearances.

3.4.3. Conduct palpation in a timely manner

"Palpation" is a diagnostic method that involves touch, feel, press, and support. During testing, palpation is used to feel the changes in students' body temperature, physical strength, and mental state through

stroking, supporting, and pressing. For example, feel the forehead to check for fever, touch the hands and feet to see if they are too cold, and understand the students' physical state by feeling their body temperature changes; support students after testing to sense their physical condition, if a student collapses after the test, feel if they are limp and weak, unable to support their own body, and pay more attention to such students; for students who cannot stand, with weak legs, drowsy eyes, and confused spirit, promptly ask other students to help them walk, and seek medical attention in severe cases.

The "Four Diagnostic Methods" of Traditional Chinese Medicine (TCM) are the treasures of our country's traditional medical culture. In middle and long-distance running physical fitness tests, fully utilize the TCM "Four Diagnostic Methods" to play the roles of observation, auscultation, inquiry, and palpation. Through "observation," grasp the details and detect potential safety hazards, to take preventive measures. Through "auscultation," understand the current situation, know the disease from its odors, understand the heart from the communication, and know the condition from the sounds. Through "inquiry," truly understand the students, ask for their inner voices and underlying causes. Through "palpation," grasp the actual situation, identify the crux of the problem, and focus on the key points. By integrating the problems found through observation, auscultation, inquiry, and palpation for a comprehensive diagnosis, promptly discover and effectively solve problems, prevent sports diseases before they occur, nip sports injuries in the bud, reduce the incidence of sports injuries, and maximize the effectiveness of the "College Students' Physical Health Standards" tests.

4. Conclusion

This paper discusses the application of Traditional Chinese Medicine's "Four Diagnostic Methods" in preventing sports injuries in the long-distance running event of the college students' physical health standard test. The article first points out the positive role of long-distance running in enhancing students' willpower, expressiveness, and social adaptability, while also emphasizing the physical and mental harm caused by sports injuries to schools, teachers, parents, and students, as well as the impact on the authenticity of the test.

The article then introduces the basic concepts and methods of the "Four Diagnostic Methods," including observation, auscultation and olfaction, inquiry, and palpation. These methods infer the internal health condition by observing the external manifestations of the patient. The author emphasizes the importance of integrating the "Four Diagnostic Methods" in TCM diagnosis and cites classical literature such as "Huangdi Nei Jing" (The Yellow Emperor's Classic of Medicine) to support this view.

In the physical health standard test, the application of the Four Diagnostic Methods is specifically divided into the following aspects:

Observation: By observing the testing environment, student status, and exercise process, potential safety hazards and students' physical and mental changes are identified in time to prevent sports injuries.

Auscultation and Olfaction: By listening to students' speech, breathing, and other sounds, as well as smelling odors, the health condition and psychological state of students are understood.

Inquiry: By asking about students' feelings and situations, specific needs and potential problems of students are understood, providing information for the prevention and treatment of sports injuries.

Palpation: By touching and feeling students' pulses and body temperatures, the physiological state of students is understood, and abnormalities are detected in a timely manner.

The article concludes by pointing out that the "Four Diagnostic Methods" of TCM have significant effects in preventing sports injuries. By comprehensively applying these four methods, problems can be identified and resolved in a timely manner, effectively preventing sports injuries, reducing their incidence, and thus giving full play to the role of physical health testing, promoting students' physical and mental health and the improvement of sports skills.

5. References

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