

2. ACTUAL PROBLEMS OF PHYSICAL CULTURE AND SPORTS

UDC 796.012.6:615.825.1:616.718-053.2

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METHODS OF KINESIOTAPING IN THE PREVENTION OF FLAT FEET IN CHILDREN

The article deals with the topical issues of the use of kinesiotaping in children with a foot arch deformity. The mechanisms of the therapeutic and prophylactic effects of kinesiotaping are characterized as well as various techniques and types of taping are presented. A comparative analysis of some methods of kinesio taping in case of the foot arch disorder in children has been carried out. The most effective technique of taping, contributing to the correction of deformity of the foot arch in children is identified.

Flatfoot is extremely common today. Changes in the shape of the foot, characterized by the omission of its longitudinal and transverse arches, is one of the most common problems in childhood. Abnormalities in the structure of the foot lead to the development of flat feet. Flatfoot is characterized by flattening of the arch of the foot, thereby impairing its function, as well as changes in the hip and knee joints, which ultimately leads to impaired gait, fatigue when walking and changes in the shape of the foot [1].

Today, due to changes in socio-economic and environmental conditions, accelerated pace of life, modification of educational programs, reduction of motor activity there is an increase in musculoskeletal system diseases, among which postural disorders and flat feet are common in preschool and school-age children. More than 50% of children have a flattened foot arch and flat feet. Deformity of the foot reduces its functional capabilities, contributes to changes in the position of the ankle, knee, hip joints and spine. All this has a negative impact on the function of the musculoskeletal system and the overall condition of the child [2].

Flatfoot is a disease that has a progressive nature, so the earlier you start comprehensive treatment, the better results it will bring.

According to the origin of flat feet there are congenital flat feet, traumatic, paralytic, rickety and static.

Congenital flatfoot at the age of 5-6 years is quite difficult to detect, since all the components of the flat foot are determined at an early age, however about 3% of all cases of flat feet are congenital. Traumatic flatfoot develops due to fractures of the ankles, heel bone, and tarsal bones. Paralytic flat foot is the result of paralysis of the plantar muscles of the foot and the muscles starting at the shin (can be a consequence of polio). Rachitic flatfoot can be caused by the body's load on the weakened bones of the foot. Static flatfoot, which occurs most frequently (82.1%), is due to weakness of the shin and foot muscles, ligamentous apparatus, and bones [4].

Internal causes contributing to the development of foot arch abnormalities include hereditary and constitutional factors, and external causes include a heavy load on the feet, wearing irrational shoes (especially with a soft back, narrow toe, thick soles, as they prevent the natural flexibility of the foot). The main reason for the development of flat feet is the weakness of the muscles and ligamentous apparatus that take part in the support of the foot arch [5].

Comprehensive application of physical rehabilitation means, preferably active, their most favorable combination, as well as the selection and justification of the duration of their use in order to prevent and correct changes in the foot in childhood is one of the priority areas of today's realities.

Therapeutic physical education for children with impaired musculoskeletal system includes the use of a variety of means and methods, where an important role played by gymnastic and sports-

applied exercises that strengthen the muscles of the foot, lower leg and trunk muscles. To enhance the corrective effect of physical exercises, special devices are used - ribbed boards, beveled surfaces, etc. All special exercises are performed in combination with exercises, aimed at formation of the skill of correct posture, general developmental exercises in accordance with the age features of the participants. Regular performance of physical exercises on the muscles of the lower limbs is one of the most important means of treatment and prevention of flat feet [1; 3].

Treatment of flat feet should be carried out comprehensively (therapeutic exercises, massage, physical therapy procedures, the use of orthopedic insoles and shoes). It is important that the correction process is regular and continues until full recovery.

Massage is an integral part of the complex treatment of flat feet. It helps to normalize the tone of the muscles of the foot and lower leg: strengthening weak, stretched muscles and relaxing the tense ones, in this particular case it is important to restore their coordinated work. In addition, by improving blood circulation and innervation, certain massage techniques improve nutrition of muscles, ligaments and bones of the foot, relieve pain in the calf muscles and feet [4].

Recently, one of the modern functional methods of preventing injuries and disorders of the musculoskeletal system is kinesiотaping. This method is the application of special elastic tapes that help improve blood supply, facilitate the passage of lymph, also tapes help maintain joints from overloading, relieve pain during sprains and dislocations, do not restrict freedom of movement and have water-resistant material.

The basis of the preventive action of kinesiотaping is the effect of activation of microcirculation in the skin and subcutaneous tissue, reduction of pain syndrome, restoration of the functional activity of muscles and normalization of joint functions. The effect of normalization of microcirculation is associated with the direct mechanical effect of the application of tapes. Applied on the surface of the skin kinesiотape, slightly lifts the upper layers of the skin, increasing the space, thereby creating favorable conditions for the activation of microcirculation in the connective tissue and intercellular substance, which helps to remove products of tissue metabolism and improve lymph flow [5].

A kinesiological tape is a tape with an elastic cotton base with the addition of nylon threads. On one side of the tape there is a hypoallergenic acrylic adhesive. The tape is characterized by high adhesive properties, which allows it to stay on the human skin for an average of 3 to 5 days and not to come off even after contact with water.

The method of preventing and treating flat feet with kinesiо tapes has a number of advantages:

- the joint is fixed in the correct position;
- triggers the regeneration process;
- the load on the foot is much easier to bear;
- pain and swelling are reduced;
- the effect of gymnastic exercises significantly increases;
- no need to wear orthopedic shoes and insoles.

It should be added that the pain syndrome is reduced due to the fact that the tape, located on the surface of the skin irritates tactile receptors and baroreceptors, from which the afferent signal goes to the posterior horns of the spinal cord, thereby blocking impulses of nociceptors. Moreover, application of the k-teip mechanically increases the space in the connective tissue, which promotes better microcirculation and removal of inflammatory mediators from the pathological focus. Activation of cutaneous receptors promotes activation of proprioceptors of muscles, tendons and joints. When the optimal motor stereotype and muscle imbalance are disturbed, various techniques of kinesiотape application are used to regulate the afferent flow of proprioceptive impulses.

Kinesiotherapy in combination with other means of rehabilitation contributes not only to the elimination of disease symptoms, but also creates conditions for consolidation of positive results for a long period [4].

The aim of this study was the theoretical and experimental justification of the application of kinesiотaping techniques of the lower limbs in children with foot arch disorders.

The study was conducted during the year 2022 on the basis of the Fitness Center "Panda". Sixteen 8- to 10-year-old children with various foot arch disorders participated in the study.

The organization of the study included three stages.

At the first stage of the study scientific and methodological literature was analyzed, medical records of children were studied, and individual conversations with their parents were conducted.

At the second stage, the most effective means of physical rehabilitation were identified and complexes of physical exercises aimed at strengthening the most vulnerable parts of the OA were compiled. A correction program was developed for children with foot arch disorders.

At the third stage, the main pedagogical experiment was conducted to substantiate the effectiveness of kinesio taping in combination with traditional methods of correction.

Kinesiotaping was used in 16 children with foot arch disorders in a complex of rehabilitation measures, in some cases as an independent monotherapeutic technique. The tape of the company "Tmax", South Korea (standard width – 5 cm) was used.

Taping for deformities of the foot arch was carried out by a course, which implied a long correction with kinesio tapes with breaks. The treatment regimen was selected individually and took into account the age and degree of deformation, as well as other individual characteristics of the subjects. The standard course of taping implied a 3-day application and then rest. Thus, the correction was carried out for 3 months.

The following techniques were used in the pedagogical experiment to apply kinesio teips to the deformed foot:

1. Method of lymphatic taping.

One I strip of 15–20 cm cut crosswise into 4 strips. Fix it solidly, with an anchor in the area of the heel tubercle, and the separated ends at the base of the toes. The second I strip of 10–15 cm, glue in the middle of the foot and fix it on the inner part of the shin. This technique involves relaxation of the plantar part of the foot and its fixation on one and the other side.

2. The technique of rigid fixation of the tape.

Place two 10–15 cm Y-strips along the sole, anchoring from the heel cusp, with the end at the base of the toes. The third I strip of 15–20 cm is glued perpendicular to the first strips, in the heel area. The presented application has a lining material tightening the arch of the foot and the initial fixation realizing the basic function of support.

3. Transverse taping technique.

A 20 cm strip I is anchored 5 cm above the medial ankle, the therapeutic area is glued to the sole of the foot and the end is in the area of the lateral ankle. In this method of application, the tape prevents the joint from shifting and deviating to the side, but it does not limit the basic stereotype of movement.

In the course of the conducted research, the effectiveness of all three techniques of kinesio taping used was revealed, in an individual selection for each trainee. In the complex application of kinesio tapes with therapeutic physical training, massage and physiotherapy, a positive effect of all means of correction of violations, regardless of the type of flatfoot, was established. These methods of taping allow to support the unformed arch of the foot, preventing its excessive flattening.

As a result of applying taping techniques for 3 months, 28% of the children showed increased adaptation to physical activity and thus reduced fatigue in gymnastics classes, 19% of the children had less ankle pain, 14% of the subjects had positive changes in mobility of the foot arch and ankle joint and 10% stopped complaining of headaches.

Thus, as a result of the pedagogical experiment it was found that kinesiotherapy in combination with other means of correction contributes not only to eliminating the symptoms of the disease, but also creates conditions for consolidation of positive results for a long period, allows increasing the effectiveness of the measures, reducing the rehabilitation period, and is appropriate along with traditional methods of rehabilitation.

It should be added that to train the muscles of the foot and lower leg, correction of the right positioning of the feet, a set of measures must be developed individually, depending on the type of

deformation and degree of flat feet. Later, when the position of the feet is restored, special exercises are performed at least 3 times a week. The important thing is the conscientious attitude of the students to the practical recommendations of the instructor and the performance of self-exercise physical exercises.

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UDC 796.012.56:796.8

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BIOMECHANICS OF MARTIAL ARTISTS INTERACTION DURING THE EXECUTION OF TECHNICAL ELEMENTS

The article is devoted to actual problems of determination of biomechanical parameters of movement during a competitive match. It examines the characteristics of movements and positions when a pair of athletes interact. The issues of the development of traction and pushing efforts of judoists in the performance of basic motor actions are considered. There are characteristics of the movement, which are fundamental to the achievement of sports results in most types of martial arts. This predetermines the evaluation of sports actions taking into account the biomechanical components of motor actions.

The study of the interaction in martial art can be approached by means of biomechanical characteristics of motion under static conditions [7]. This can be determined with the help of classical motion analysis systems allowing to combine results of structural elements [9].

There is a differential analysis method used in the study of throw technique. As a rule, motion is divided into three distinct phases: imbalance, positioning, projection, (Kuzushi, Tsukuri, Kake) [2]. At the same time, in all types of martial arts, there are two main stages of training technical actions, namely, the study of technical interactions in the pairing system of athletes and the movement system of the pair of competing athletes [3].

In the phases of the destruction of balance – Kuzushi and creating the precondition for the throw – Tsukuri, identifying the structure of the movements, are invariants of general action. The specific invariants of action are the throwing techniques that do not require imbalance. In addition,