

Modern technologies used in the process of physical education and rehabilitation for violations of posture and flat feet in children of older preschool age

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Purpose: analyze and summarize scientific information on the problem of technologies that are used in the process of physical education and rehabilitation for violations of posture and flat feet in children of older preschool age, according to special scientific and methodological literature.

Material & Methods: theoretical analysis and generalization of literary and documentary sources included the use of a number of the following methods: the method of reconstruction, the method of apperceptions, aspect analysis, hermeneutic analysis, problem analysis.

Results: despite a significant number of scientific studies on the prevention and correction of human posture disorders, recent results and their undoubted value for science and practice, it can be stated that the proposed technologies and methods do not fully allow to effectively cope with the steadily growing number of children senior preschool age with various functional disorders of the locomotor system.

Conclusion: every year the number of children of senior preschool age with functional disorders of posture increases. Inadequate efficiency of health-improving measures for violations of the posture of children of senior preschool age by many researchers is due to the insufficiently developed technology for assessing her condition. Obtained data indicate the need to develop a technology for measuring and analyzing the level of the biogeometric profile of the posture of children aged 5–6 years in the frontal and sagittal planes.

Keywords: posture, children of senior preschool age, physical rehabilitation, physical education.

Introduction

A healthy child is the main goal of the nearest and remote future of any country, as the prospects for social and economic development, a high standard of living, science and culture [6; 7; 13; 21].

In modern conditions of urbanization, computerization, exacerbation of social problems, unsatisfactory ecological condition in Ukraine, the full-value physical development of children, the increase in the level of adaptive capabilities of their organism [9; 13]. Of particular concern is the prevalence among children of 5–6 different functional disorders of the musculoskeletal system (MSS) [1; 8; 10; 11; 12].

Today the range of proposed technologies, techniques and programs for determining the state of posture is quite wide and multifaceted.

Relationship of research with scientific programs, plans, themes. Article is made according to the topic Consolidated Plan of research in the field of physical culture and sports for 2011–2015. Ministry of Ukraine for Family, Youth and Sports on the topic 3.7. “Perfection of biomechanical technologies in physical education and rehabilitation taking into account individual characteristics of human motor skills” (state registration number 0111U001734) and the plan for the research work of the National University of Physical Education and Sports of Ukraine for 2016–2020. on the topic 3.13 “Theoretical and methodological foundations of health-

forming technologies in the process of physical education of various population groups” (state registration number 0116U001615).

The purpose of the research: to analyze and summarize scientific information on the problem of technologies that are used in the process of physical education and rehabilitation for violations of posture and flat feet in children of older preschool age, according to special scientific and methodological literature.

Material and Methods of the research

Theoretical analysis and generalization of literary and documentary sources provided for the use of a number of the following methods: the method of reconstruction, the method of apperceptions, aspect analysis, hermeneutic analysis, problem analysis.²

Results of the research and their discussion

When organizing the physical culture and health work in a preschool institution, as noted by S. P. Ryzhova [23], it is necessary to pay attention to the issue of preventing children's flatfoot and clubfoot, while taking an integrated approach, the main means of prevention of which is special gymnastics aimed at strengthening soft intramuscular-binding apparatus of the feet and shin. The author suggests using specially organized classes on the type of physical culture.

E. V. Makarova [19] emphasizes that in the rehabilitation of children with MSS disorders it is necessary to take into account the functional characteristics of children with impaired posture, their rapid fatigue in the process of activity, it is necessary to exercise special care in terms of the magnitude and volume of the loads, use breathing exercises to eliminate fatigue. Specialist for the treatment of early manifestations of scoliosis in combination with the hypermobility syndrome for children 5–6 years developed a comprehensive program of physical rehabilitation. A special feature of the physical rehabilitation of this contingent of children, according to the author, is the 24-hour observance of the orthopedic regime, the upbringing and fixing of the habit of correct posture in special occupations and throughout the day, daily therapeutic curative gymnastics, therapeutic swimming, therapeutic choreography, massage and electric stimulation procedures of soft muscles [19].

For the purpose of correcting postural and flatfoot disturbances, A. A. Potapchuk [22] suggests using both physical exercises and hygiene factors. In his conception the author gives an important role to the statodynamic regime of children, both in the pre-school institution and at home. In the rehabilitation and strengthening exercises, the author recommends including story-role games with musical accompaniment, which increases the interest of children in their studies [22].

To correct the violations of the MSS in the employment of a specialist [22] also included fitball-gymnastics, which allows to use an individual approach and naturally to form a habit of correct posture, and also to make emotional coloring.

Differentiated corrective programs for the rehabilitation of children with functional and static deformities of the feet, including complex therapy, contribute to the normalization of the motor function, the strengthening of the musculoskeletal apparatus of the foot and the harmonious development of children, developed and tested by Mohammed Amro [20].

The first program involves the use of hydrokinesiotherapy with the inclusion of classical and segmental massage, procedures for therapeutic gymnastics and orthopedic exercises [20].

The second comprehensive program with elements of yoga gymnastics consists of traditional oriental shiatsu massage, therapeutic gymnastics and orthopedic activities [20].

Of interest is the system of prevention and correction of MSS deviations in children by means of physical education, scientifically founded by G. I. Narskinim [27]. The developed system of prophylaxis and correction of deviations of MSS of children allows to systematically carry out work on revealing and elimination of possible deviations by means of physical education. The author developed an algorithm consisting of modules for analysis, correction, control and prevention. According to the author, the module is a relatively independent part of the developed algorithm in preventing deviations from the MSS.

The basis of the prevention module is physical exercises aimed at: normalization of trophic functions of the responsible structures of the spinal column; development of mobility in all joints; formation of a muscular corset; flatfoot prevention [27].

As the author [27] notes, if the analysis of the MSS shows that

the child has deviations from the norm, he is recommended to use the means of physical education of the correction module, based on corrective exercises. In view of the existing deviations from the MSS, exercises aimed at: inhibition of pathogenesis mechanisms are selected; correction of existing deviations in the MSS state; formation of a muscular corset; biomechanics and trophism of the spinal column.

For children with functional disorders of the MSS in the process of physical education, Gasemi Behnam [4] suggests using a comprehensive course of training and corrective gymnastics and massage up to 1,5–2 months. During the year it is necessary to carry out 2–3 such courses. Therapeutic gymnastics consists of general development exercises for various muscle groups; special exercises for strengthening and training the muscular corset with and without objects, using orthopedic balls; relaxation and breathing exercises; games of medium mobility to consolidate the achieved skills of correct posture [4].

The method of prevention and correction of violations of the MSS of preschool children, which allows integrating educational and health problems in the process of physical education, presupposes the division of the occupation into 6 blocks: stretching; running and jumping performed on a soft support; a complex of general development exercises with the primary use of the starting positions, standing on the front of the foot, maintaining balance; training in basic movements; development of physical qualities; relaxation exercises developed by G. G. Lukin [18].

S. A. Kastyunin [14] suggests combining therapeutic exercise with swimming in the case of postural disorders. Classes are planned in such a way, implying for the child an active physical load, the creation of a muscle corset, the formation of a correct posture. The complex of exercises on the water allows you to protect the growth zones of the vertebral bodies, to unload the spinal column.

Correction and health improvement program of physical education on the basis of a differentiated approach to diagnosis and correction of various signs of postural disorders in children aged 6–7 years was developed by T. A. Guterman [5]. The main notable features of this program are:

- a complex combination of two times a week of physical fitness training and one lesson on corrective aqua aerobics;
 - inclusion in the basic part of the increased (up to 33%) volume of special corrective exercises;
 - inclusion in the variable part of the program three courses a year of therapeutic and health-improving massage, phytotherapy, physiotherapy, psycho-correction classes, individual work on assignment in working conditions with parents;
 - availability of methodical and organizational approaches to the correction of posture defects that provide for the complex nature of the influence of the means used to correct posture disorders, the consideration of various signs of postural disorders and their gradation in terms of the degree of defect development, individual tasks and the optimal distribution of the share of recreational physical education means throughout the year.
- In the work of L. N. Timoshenko, S. G. Lavrenyuk, T. P. Zhukovs-

kaya [24], a valid system of measures aimed at the prevention and correction of MSS disorders in preschool children. When composing the complexes of morning exercises, complexes of exercise therapy, the authors relied on the program "Be Healthy, Baby", the State Basic Program, the Basic Component.

In the experimental study of I. S. Krasikova [16] the problems of formation of posture in preschool children are considered. The specialist offers the author's complexes of gymnastic exercises aimed at the formation of proper posture, contribute to the formation of skills necessary in everyday life, as well as the development of physical qualities.

O. N. Bondar [2] substantiated and developed the technology of correction of posture disorders for children of senior preschool age, taking into account the spatial organization of their body. The technology consists of a correction-prophylactic macrocycle, which includes three stages – retracting, correcting, supporting-improving, and provides for the use of special physical exercises in the starting positions that facilitate the unloading of the spine, complexes of corrective physical exercises that take into account deviations in the parameters of the goniometry of the children's body, as well as exercises aimed at forming the skill of statistical dynamical posture.

A component of the developed technology is pedagogical monitoring, which allows observing, measuring and evaluating the indices of the biogeometric profile of the posture, the functional state of the MSS, as well as the biostatistical indices of the body of children of the senior preschool age in the process of physical education [2].

A. S. Filimonova [25] substantiated the program of physical education of children of senior preschool age, taking into account the state of MSS on the basis of fitness. The structural construction of the program provides for four interrelated blocks: projective, informative, procedural, control and accounting.

I. A. Bichuk [3] developed a technology for preventing flat feet in preschool children. The author has referred to the main components of the technology the block diagram of the technology (diagnostics, substantiation of program content, practical implementation, control); subjects of technology implementation (instructors of physical culture, educators, parents, children); the content of the flatfoot prevention program (goal, tasks, principles, methods, means, methods of training, forms of training, implementation stages, control, result) stages of program implementation (preparatory, main, final) program implementation results. The main functions of technology – management, health, information, forecasting [3].

The flatfoot prevention program provides for training in the form of morning exercises, physical education classes, walks and homework [3].

Kord Makhnaz [15] based on the analysis of literature sources, the experience of leading specialists and the results of the previous study, a program of physical rehabilitation has been developed that is based on the pedagogical principles and the principle of differentiation of special-purpose physical exercises that affect individual muscle groups, depending on the localization of the lesion and character changes in the stato-dynamic stereotype. The program consists of three periods – adaptation, correction and stabilization. In

the complexes of therapeutic gymnastics, the author used special exercises performed in the training mode with a dosage of 10–12 repetitions, to strengthen the muscular corset in conjunction with performing exercises to strengthen the muscular-joint feeling on the balancing platforms, pillows and paths for proprioception in combination with the method of automyorelaxation [15].

A. N. Kudyashevoy [17] for the first time the method of rehabilitation and prevention of child's posture disorders based on the use of therapeutic physical culture with elements of hatha yoga and swimming has been theoretically developed and experimentally substantiated, it allows to correct the violations of the posture of those engaged, to develop the functional capabilities of their body systems and to effectively enhance level of physical readiness.

Y. V. Kozlov [26], on the basis of the revealed relationships between the support-spring properties of the foot and the biogeometric profile of the posture, the content and direction of the correction technology for non-fixed violations of the locomotor system in children aged 5–6 years with the use of physical rehabilitation in preschool general educational institutions, a distinctive feature of which is the availability of variable and basic components. Specialist scientifically methodologically valid variational and basic component of the technology of correction of non-fixed violations of MSS in children 5–6 years old, including corrective gymnastics using exercises aimed at the development of vestibular function, massage, electrostimulation with biofeedback in conditions of pre-school general educational institutions [12; 26].

Conclusions

Today, there is no doubt that posture, as a whole phenomenon, is a complexly organized object whose state is determined by the interaction of several factors: the morphological development of the MSS, the effective functioning of life support systems, the system of pedagogical influence on physical development to the exercising process.

Despite a significant amount of scientific research on the prevention and correction of human posture disorders, recent results and their undoubted value for science and practice, it can be stated that the proposed technologies and methods do not fully allow effectively cope with the steadily growing numbers people with various functional disorders of the MSS.

Every year the number of children of senior preschool age who have violations of the posture of functional disorders of the MSS of children of senior preschool age increases. Inadequate efficiency of health-improving measures for violations of the posture of children of senior preschool age by many researchers is due to the insufficiently developed technology for assessing her condition.

The obtained data indicate the need to develop a technology for measuring and analyzing the level of the biogeometric profile of the posture of children aged 5–6 years in the frontal and sagittal planes.

Prospects for further research will be related to the development of technology for assessing the state of the biogeometric profile of the posture of children aged 5–6 years in the process of physical rehabilitation.

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