Ministry of Education and Science of Ukraine

Oleksandr Dovzhenko Hlukhiv National Pedagogical University

Lisnevska Nataliia Valentynivna

Health technologies and diagnostic methods of physical education of children

Educational and methodological manual

Hlukhiv-2025

УДК 373.2.015.31:796(07)
L 63

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Reviewers:

Karnaukh L.P. – Candidate of Pedagogical Sciences, Professor of the Department of Psychology and Pedagogy of Child Development of the Pavlo Tychyna Uman State Pedagogical University.

Pinchyk I.O. – Doctor of Pedagogical Sciences, Professor of the Department of Pedagogy and Psychology of Primary Education of the Oleksandr Dovzhenko Hlukhiv National Pedagogical University.

Lisnevska N. V.

L 63 Health technologies and diagnostic methods of physical education of children. Educational and methodological manual. / Author-compiler N. V. Lisnevska. Hlukhiv : Oleksandr Dovzhenko Hlukhiv NPU, 2025. 196 p.

The manual contains educational and methodological support for studying the discipline for students of the «Bachelor» degree of full-time study in the specialty 012 Preschool Education.

The manual contains a syllabus, a work program, a course of lecture material, which includes a list of literary sources for each topic, plans for practical lessons by semesters, a list of module control questions, and methodological recommendations for performing independent work.

УДК 373.2.015.31:796(07)

CONTENT

PREFACE

If you want to raise a happy child, raise a healthy child.
J.-J. Rousseau

Childhood is an important period for the formation, preservation, and strengthening of children's health. After all, it is during preschool age that active physical and mental development of the body occurs, and the foundation of health is laid. This is especially relevant today, when, due to the deterioration of the demographic, environmental, and economic situation in the country, there is a rapid deterioration in the physical, mental, spiritual, and social health of preschool children, as well as their physical development.

The problem of preserving and strengthening of preschool children health and their physical development is at the centre of the country attention , which is reflected in a number of state documents (the laws of Ukraine "On Education", "On Preschool Education", "On the Protection of Childhood"), but this is not enough. Based on the fact that health is important in the formation of a child's personality, his physical and mental development, the main task of the educator should be to strengthen it.

Teachers attach great importance to physical education as the main means of preserving and strengthening children's health and their physical development. However, today's evidence shows that this is not enough to form children's health-preserving competence and their health culture.

We believe that educators should regularly monitor children's physical development, and for this they need to know diagnostic methods. In addition, due to the constant deterioration of children's health, educators should be able to use various non-traditional means of recovery – health technologies.

Knowledge of the methodology and features of health-improving technologies application will help the educator not only strengthen the health of children, but also diversify their motor activity, improve physical and mental development.

CHAPTER 1. SYLLABUS

Faculty of Preschool Education Department of Theory and Methods of Preschool Education	
HEALTH TECHNOLOGIES AND DIAGNOSTIC METHODS OF PHYSICAL EDUCATION OF PRESCHOOL CHILDREN	

Level of higher education	first (bachelor's)
Discipline status	normative
Speciality	01 Education/ Pedagogy
Subject speciality/specialisation	012 Preschool Education
Educational and professional programs	Preschool_Education_and_Physical_Culture
Number of credits	6
Form of education	full-time study

Lecturer: Candidate of Pedagogical Sciences, Associate Professor Lisnevska N. V.
Email: lisnevska@gnpu.edu.ua

Amount of study time

Lectures	30
Practical training (classes)	46
Independent work of the student	104
Type of control	C T

The purpose of the course is to prepare students for mastering theoretical knowledge, skills and abilities regarding the peculiarities of conducting health

technologies in preschool educational institutions for the purpose of physical education of preschool children, their mental development, as well as the formation, preservation and strengthening of health; conducting diagnostic methods to determine their level of physical development, acquaintance of students with the peculiarities of planning work on health technologies, training and conducting them with preschool children.

The course is aimed at mastering health technologies and diagnostic methods of physical education, which will allow the future specialist to plan health work with preschool children in order to form, preserve and strengthen the health of preschool children, as well as their physical development.

The course "Health Technologies and Diagnostic Methods of Physical Education of Preschool Children» is based on interdisciplinary knowledge of such courses as: "Pedagogy", "Psychology", "Theory and Methods of Physical Education", etc., so it is quite logical to study the course after the mentioned courses.

As a result of studying the course, the student acquires general and professional competences

Competence code	**Name of the competence**	**Programme learning outcomes**
General competencies:		
GC -3.	Ability to think abstractly, analyse and synthesise.	**PLO-01.** Understand and define pedagogical conditions, patterns, principles, goals, objectives, content, organizational forms, methods and tools used in working with children from birth to school; find typical features and specifics of the educational process and development of preschool children.
GC -4.	Ability to communicate in the state language both orally and in writing.	
GC -7.	Ability to learn and master modern knowledge.	
GC -8.	Ability to apply knowledge in practical	

	situations.	
Professional (special) competencies:		
GC -1.	Ability to work with sources of educational and scientific information.	**PLO-05.** To carry out interaction in the work of preschool education institution, family and school. Involve parents in the organisation of the educational process with preschool children in the preschool education institution. **PLO -06.** Establish a link between pedagogical influences and children's results. **PLO -14.** Have the skills to preserve and strengthen the psychophysical and social health of children. **PLO -22.** To comply with the conditions for the safety of preschool children. **PLO -31.** Be able to plan and conduct physical education and recreation work with preschool children in order to correct their physical development, appropriately choosing health-improving (health-saving) technologies, prepare and properly select sports equipment and equipment for physical education and recreation classes**.**
GC -12.	Ability to physical development of children of early and preschool age, correction and strengthening of their health by means of physical exercises and motor activity.	
GC -18.	Ability to find and process relevant educational information and apply it in work with children and parents.	
GC -20.	The ability to self-education, self-development, continuity in education for constant deepening of general and professional training, transformation of education into a process that lasts throughout a person's life.	

GC -24.	Ability to apply health-improving (health-saving) technologies in physical education and health work with preschool children; to create a health-preserving environment in preschool education institutions.	

Teaching methods are verbal, visual, practical, practical-theoretical, reproductive, partially research-based, problem-based, positional, interactive learning, distance, information and communication technologies, etc.

Organisational and academic responsibilities of students:

- Attend lectures and practical classes
- Perform practical tasks provided for in the plans of practical classes
- Participate in practical classes during the discussion of theoretical issues, performing collective and individual tasks, testing, etc.
- Reasonably defend their own opinion on the topic of the class, if it does not coincide with the opinion of the lecturer
- Independently master the theoretical material of individual topics or issues based on the recommended literature, make notes, tables, diagrams, perform tasks of different levels

Perform tasks of thematic control, participate in the final testing

- If necessary, receive additional consultations from the lecturer on the content of the discipline
- In case of disagreement with the grade received, have the right to re-examine the topics
- Pass the relevant topics on time
- Follow the rules of safety and labour protection.

THEMATIC PLAN

Lecture topics	
1	Implementation of health technologies in the educational and recreational activities of preschool children (4 hours).
2	History of the origin and development of health technologies (2 hours).
3	Methods of conducting of health technologies with preschool children (4 hours).
4	Influence of health technologies on the body of preschool children (4 hours).
5	Characteristics of physical development of preschool children and its control (4 hours).
6	Formation of correct posture and arch of the foot as an indicator of physical development of preschool children (4 hours).
7	Additional examination of the health status of preschool children in the conditions of preschool education institutions (4 hours).
8	Control over the physical development of preschool children (4 hours).
Topic of the practical classes	
1	Implementation of health technologies in the educational and recreational activities of preschool children (6 hours).
2	History of the origin and development of health technologies (6 hours).
3	Methods of conducting of health technologies with preschool children(6 hours).
4	Influence of health technologies on the body of preschool children (6 hours).
5	Characteristics of physical development of preschool children and its control (6 hours).
6	Formation of correct posture and arch of the foot as an indicator of physical development of preschool children (6 hours).
7	Additional examination of preschool children's health status in the conditions of preschool education institutions (4 hours).
8	Control over the physical development of preschool children (6 hours).

Determination of the final grade according to Table 2 on the national and ECTS scales:

Table 1

Correspondence of assessment scales (national and European (ECTS))

ECTS assessment	National assessment
1	3
A	High level of theoretical knowledge and practical skills
B	Sufficient level of mastery of the knowledge of the educational material, skills of their practical implementation
C	Medium-sufficient level of mastery of theoretical material and readiness to use the acquired skills
D	Average level of theoretical knowledge and practical skills
E	The level of mastery of theoretical material, practical skills and abilities is below average
FX	Low level of mastery of educational material, the student is not able to master practical skills without additional classes in the discipline
F	Low level of knowledge of the discipline, lack of practical skills, which is the reason for repeated study of the discipline

Distribution of points within the academic course from which the form is provided final control – exam (full-time studying)

Table 2

Auditory work									**Independent, individual work**	**Modular control**	**Form semester certification - credit test**
Maximum number of points – 60									Maximum number of points – 10	Maximum number of points – 20	Maximum number of points – 10
2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	1.25 points for each of	Modular control 1 –	
2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6			

2,6	2,6	2,6	2,6	2,6					the 8 topics	10 points Modular control 2 – 10 points	

List of recommended references

Main:

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2. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

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Additional:

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preschool education institutions. Collection of scientific works SWorld. Pedagogy, psychology and sociology. Issue 49. Volume 2. Ivanovo: Scientific World, 2017. P. 32-36.

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10. Makovetska N. V. Games with sand as a means of improving preschoolers' health. URL : http://librar.org.ua (accessed 27.08.2024).

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12. Pechka L. Fitball - friend, partner and trainer. Preschool education. 2014. № 3. P. 24-27.

13. Chernenko N.I., Vyhovska O.E., Kukurudza L.M. Implementation of health-forming technologies in the practice of work of preschool education institutions [Text]. Preschool education institution. 2015. № 10. P. 16-26.

Internet sources:

1. Arghirova G. What is art therapy and why it is effective in working with children

during the war. URL : https://voices.org.ua/news/shcho-take-artterapiia-ta-chomu-vona-efektyvna-u-roboti-z-ditmy-pid-chas-viyny/ (accessed: 29.08.2024)

2. Ovdiienko N. V. The use of art therapy methods in work with preschool children. URL : https://vseosvita.ua/library/konsultacii-dla-vihovateliv-vikoristanna-metodiv-art-terapii-v-roboti-z-ditmi-doskilnogo-viku-258516.html (accessed: 29.08.2024)

3. Reactivity of the body. Immunity and allergic reaction. https://evnuir.vnu.edu.ua/bitstream/123456789/17106/7/%D0%9B%D0%B5%D0%BA%D1%86%D1%96%D1%8F%206.pdf (accessed: 29.08.2024)

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CHAPTER 2. ACADEMIC PROGRAMME

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

Oleksandr Dovzhenko Hlukhiv National Pedagogical University

APPROVED BY

First Vice-Rector

_____ Maryna KHROLENKO

"____" _____2024

Academic Programme

of the course **"Health technologies and diagnostic methods of physical education of children"**

Field of knowledge: __01 Education / Pedagogy _____

Speciality: __012 Preschool Education_.

Subject speciality/specialisation: _____012 Preschool Education _____

Level of higher education: ___first (bachelor's) level

Educational and professional programme: _Preschool_Education_and_Physical_Culture

Status: ___vocational training cycle, normative academic discipline_____

Structural subdivisions (faculties, departments) responsible for the implementation of of the discipline: _faculty of preschool education_____

Department: _theory_and_methods_of_preschool_education

Form of studying	Course	Semester	Total workload		Number of hours						Type of the semester control	
					Classroom training				Individual work of the student	Independent work of the student		
			European credits	Hours	Total	Lectures	Laboratory work	Practical training			Credit Test	Examination
Full-time studying	III-IV	6,7	6	180	76	30		46		104	C T	

Hlukhiv-2024

The working program is based on: Standard of higher education of Ukraine: first (bachelor) level, field of knowledge 01 Education/Pedagogy, specialty 012 Preschool education, professional standard "Educator of a preschool education institution", OPP "Preschool education and physical culture", training plans Bachelors in the specialty 012 Preschool education.

Compiler of the academic programme: _ Nataliia LISNEVSKA, Candidate of Pedagogical Sciences, Associate Professor _____

APPROVED BY

Department of Theory and Methods of Preschool Education _____

minutes of "26" _August__, 2024 № _1__

Head of the Department Alina Dmytrenko, Doctor of Philosophy,

Associate Professor _____

APPROVED BY

the Academic Council of the Faculty / Institute of Preschool Education _____

minutes of "27" _August__ 2024__ № __1___

Chairman of the Academic Council of the Faculty _Inna_Kulish, Candidate of Pedagogical Sciences, Associate Professor _____

APPROVED

Guarantor of the educational programme Preschool Education and Physical Education

Nataliia KHLUS, candidate of sciences in physical culture education and sports, Associate Professor _____

Explanatory Notes

The period of childhood is the most crucial for mental and physical development, personality formation, and laying the foundation for health. In the process of physical education, children develop mental processes, eye gauge, coordination of movements, strengthen muscles, develop body systems (cardiovascular, respiratory, digestive, nervous), and foster moral and volitional qualities (mutual assistance, responsibility, honesty, perseverance, courage, decisiveness, etc.), which contributes to the harmonious development of their body and health. All of this is fully

realised during the implementation of health-improving technologies with preschoolers. In addition, in the course of physical education of children, it is important to monitor the development, which is carried out through diagnostic methods.

Prerequisites: the course "Health technologies and diagnostic methods of physical education of children" is based on interdisciplinary classes from such educational disciplines as: "Pedagogy of preschool children", "Children's psychology", "Anatomy and physiology", "Theory and methods of physical education of preschoolers", therefore it is quite logical to study a discipline after the above disciplines.

The purpose of the course is to prepare students for mastering theoretical knowledge, skills and abilities regarding the peculiarities of health technologies in preschool educational institutions for the purpose of physical education of preschool children, their mental development, as well as the formation, preservation and strengthening of health; conducting diagnostic methods to determine their level of physical development, acquaintance of students with the peculiarities of planning work on health technologies, training and conducting them with preschool children.

The subject of health-improving technologies and diagnostic methods of physical education of children is to arm future educators with the necessary knowledge, the formation of relevant skills and abilities regarding their organization and implementation.

THE OBJECTIVES OF THE COURSE ARE:

- mastering the scientific, theoretical and practical foundations of the discipline "Health technologies and diagnostic methods of physical education of children";

- mastering the knowledge, skills and abilities of organising and conducting classes in health technologies, applying diagnostic techniques to determine the level of physical development of children;

- ability to work with parents on this issue;

- mastering the methodology of scientific, methodological and research work

on topical issues of the course.

Students studying the course acquire the professional competences listed in Table 1.

Competence code	Name of the competence	Programme learning outcomes
General competencies:		
GC-3.	Ability to think abstractly, analyse and synthesise.	**PL-01.** Understand and define pedagogical conditions, patterns, principles, goals, objectives, content, organisational forms, methods and tools used in working with children from birth to school; find typical features and specifics of the educational process and development of preschool children.
GC -4.	Ability to communicate in the state language both orally and in writing.	
GC -7.	Ability to learn and master modern knowledge.	
GC -8.	Ability to apply knowledge in practical situations.	
Professional (special) competencies:		
GC -1.	Ability to work with sources of educational and scientific information.	**PL-05.** To carry out interaction in the work of preschool education institution, family and school. Involve parents in the organisation of the educational process with preschool children in the preschool education institution. **PL-06.** Establish a link between pedagogical influences and children's results. **PL-14.** Have the skills to preserve and strengthen the psychophysical and social health of children.
GC -12.	Ability to physical development of children of early and preschool age, correction and strengthening of their health by means of physical exercises and motor activity.	
GC -18.	Ability to find and process relevant educational	

	information and apply it in work with children and parents.	**PL-22.** To comply with the conditions for the safety of preschool children.
GC -20.	The ability to self-education, self-development, continuity in education for constant deepening of general and professional training, transformation of education into a process that lasts throughout a person's life.	
GC -24.	Ability to apply health-improving (health-saving) technologies in physical education and health work with preschool children; to create a health-preserving environment in preschool education institutions.	

Organization of training

Types of classes. The lecture involves direct contact between the teacher and the audience. During lectures, theoretical questions of each specific topic are considered. When preparing for such classes, students study scientific and methodological literature, professional periodicals and primary sources on the theory and methods of forming mathematical concepts, establish interdisciplinary connections, acquiring scientific and theoretical knowledge. During the lecture, questions are used, the purpose of which is to find out the level of readiness of students to perceive the following material and activate cognitive activity. Lectures and presentations created using Microsoft Power Point are used in classes.

Practical training involves the formation of the ability to introduce health technologies and diagnostic methods in working with preschool children, develop lesson notes, create visual aids, develop consultations for parents on current problems of children's development. The list of topics of practical work is determined by the work curriculum of the discipline.

Content of the practical session: preliminary control of knowledge, abilities and skills by the acquirer; formulation of a general problem by the teacher and its discussion with the participation of applicants, solving control tasks, their verification, evaluation. The grades received by the applicant for individual practical classes are counted when issuing the final grade for the academic discipline.

Student independent work (SRS) is an independent activity of a student, which is carried out according to the task and under the control of the teacher, but without his personal participation, aimed at the formation of independence, the development of creative qualities of the individual. The content of independent work on topics is determined by the work program of the academic discipline and contains tasks of various types, such as: preparation of theoretical questions; performance of practical tasks; summarizing primary sources; performance of individual (professionally oriented) tasks; preparation for final module works; preparation for the credit test.

Peculiarities of mastering the educational component during distance education

The lecture in the online format assumes that applicants receive information about the lecture material through means of telecommunications in synchronous mode using the Internet resource Zoom (applicants receive information from the lecturer, with the opportunity to ask him questions in real time, or in the form of a problem discussion. The lecture material of the topics is placed on the "Google classroom" platform and is available to applicants.

Practical training in remote mode can take place in the mode of video conferences using the Internet resource Zoom and with the help of the "Google classroom" platform. During practical classes in remote mode, communication between applicants and the lecturer will involve discussion of the topic, problematic issue, holding a discussion, etc.

The organization *of independent work in the conditions of distance education* is carried out using the Internet resource Zoom and with the help of the "Google classroom" platform, where a list of tasks is presented. (preparing messages and performing exercises, solving creative tasks – modeling situations, preparing presentations, etc.).

Organizational and educational responsibilities of students:

- attend lectures and practical classes;
- participate in practical classes during the discussion of theoretical issues, performance of collective and individual tasks, testing, etc.;
- defend one's own opinion on the topic of the lesson with arguments, if it does not coincide with the teacher's opinion;
- perform thematic control tasks, participate in final testing;
- if necessary, receive additional consultations from the teacher on the content of the educational component;
- in case of disagreement with the received assessment, have the right to redo the topics;
- to observe the rules of safety and occupational health and safety in conditions of uncertainty, during air alarms.

Methods: verbal, visual, practical, problematic; interactive learning technologies, information and communication technologies.

Technical and software/equipment, visualization: technical (computer), software (Microsoft Office: Power Point, Word); visibility (presentations in Power Point format).

The student of higher education has the right to the recognition of learning results (skills, competences) in non-formal education, which apply to normative and selective components, which in terms of subject and content correspond to the educational discipline in general, as well as its separate sections, topics, individual tasks, which are provided for the work program (syllabus) of the academic discipline (Regulations on the procedure for recognizing learning results obtained in non-formal education)

http://gnpu.edu.ua/images/dokumenty/%D0%9F%D0%BE%D0%BB%D0%BE%D0

%B6%D0%B5%D0%BD%D0%BD%D1%8F%20%D0%BF%D1%80%D0%BE%20%D0%BD%D0%B5%D1%84%D0%BE%D1%80%D0%BC%D0%B0%D0%BB%D1%8C%D0%BD%D1%83%20%D0%BE%D1%81%D0%B2%D1%96%D1%82%D1%83.pdf

Key concepts: technology, health technologies, diagnostic methods, posture, flat feet.

Description of the course

Cover page of the description

Name of the course "**Health technologies and diagnostic methods of physical education of children**"

Characteristics of the course	Field of knowledge, specialty, level of higher education, name of the educational program	Academic calendar, types of classes
number: ECTS credits 6 modules 4 content modules 4 The total amount of discipline 180_ hours. classroom hours per week	Field of study: 01 Education / Pedagogy Speciality: 012 Preschool education. Educational qualification level: First (bachelor's) level Name of the educational program**:** __ Preschool_Education_and_Physical_Culture	Status of the discipline: vocational training cycle, normative academic discipline Course III/IV Semester 6,7 Total hours: lectures 30 practical 46 Independent work of the student: 104 Type of final

		control: **credit test**

Structure of academic credits in the course

Topics	Classroom training. (f-t.s.)	Lecture	Practical training	Independent work of the student
Module I. Theoretical foundations of the course "Health technologies and diagnostic methods of physical education of preschoolers" and methodological guidance on the use of health technologies in work with children				
Content module 1.1.				
Lecture 1.1. **Implementation of health technologies in the educational and recreational activities of preschool children.**	10	4	6	13
Lecture 1.2. **History of the origin and development of health technologies.**	8	2	6	13
Lecture 1.3. **Methods of conducting health technologies with preschool children.**	10	4	6	13
Lecture 1.4. **Influence of health technologies on the body of preschool children.**	10	4	6	13
Module II. Methodological guidance on the use of diagnostic methods to				

determine the physical development of preschool children				
Content module 2.1.				
Lecture 2.1. **Characteristics of physical development of preschool children and its control.**	10	4	6	13
Module III. Methodological guidance on the use of diagnostic methods to determine the health status of preschool children				
Content module 3.1.				
Lecture 3.1. **Formation of correct posture and arch of the foot as an indicator of physical development of preschool children.** Lecture 3.2. **Additional examination of preschool children's health in the conditions of PEI.**	10 8	4 4	6 4	13 13
Module IV. Methodological guidance for monitoring children's physical development				
Content module 4.1.				
Lecture 4.1. **Control over the physical development of preschool children.**	10	4	6	13
In total for 6,7f-t.s. semesters:	**76**	**30**	**46**	**104**

Content of the lecture course

Topic number	List of content modules, lecture topics, their annotations	Number of hours f-t.s.
1.	***Module I. Theoretical foundations of the course "Health technologies and diagnostic methods of physical education of preschoolers" and methodological guidance on the use of health technologies in work with children*** ***Content module 1.1.*** **Lecture: Implementation of health technologies in the educational and recreational activities of preschool children** Plan 1. The concepts of "technology", "health-saving technologies", "health technologies". The concepts of the topic are revealed, their analysis and characteristics are given. 2. The use of innovative health technologies to preserve and improve the health of preschool children. Innovative health technologies are defined and characterised. 3. Health-improving technologies with preventive and therapeutic purposes in the practice of work of preschool education institutions with preschool children. Health technologies for preventive and therapeutic purposes are defined and characterised. 4. Influence of therapeutic health technologies on physical and mental development of preschool children. Health technologies of therapeutic orientation are defined and characterised.	4

	Literary sources **Main:** [2]. **Additional:** [2;3;4;5;6;8;9;10;11;12;13]. **Internet sources:** [1;2].	
2.	**Lecture: History of the origin and development of health technologies** Plan 1. The history of the development of innovative health technologies (fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics). The history of the origin and development of football gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics development, hydro aerobics are revealed. 2. History of the development of preventive and therapeutic health technologies (aromatherapy, phytotherapy, vitamin therapy). The history of the origin and development of aromatherapy, phytotherapy, vitamin therapy are revealed. 3. The history of the origin and development of therapeutic health technologies (bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy). The history of the origin and development of bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy development, reflexology, game therapy, sand therapy, colour therapy are revealed.	2

	Literary sources **Main:** [2]. **Additional:** [3;4;6]. **Internet sources:** [1;2].	
3.	**Lecture: Methods of conducting of health technologies with preschool children** Plan 1. Methods of conducting innovative health technologies; fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics. Methods of conducting fitball gymnastics, breathing exercises, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics development, hydro aerobics are revealed. 2. Methods of conducting preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy. Methods of conducting of aromatherapy, phytotherapy, vitamin therapy are revealed. 3. Methods of conducting therapeutic health technologies: bibliotherapy, laughter therapy, music therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy. Methods of conducting of bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy development, reflexology, game therapy, sand therapy, colour therapy are revealed. ***Literary sources***	4

	Main: [2]. **Additional:** [4;5;7;8;8;9;12;13]. **Internet sources:** [1;2].	
4.	**Lecture: Influence of health technologies on the body of preschool children** Plan 1. Influence of health technologies on the respiratory system of children. Children's respiratory system is analysed. The influence of health technologies on the respiratory system of preschool children is revealed. 2. Influence of health technologies on the cardiovascular system of children. The cardiovascular system of children is analysed. The influence of health technologies on the cardiovascular system of preschool children is revealed. 3. Influence of health technologies on the immune system of children. The immune system of children is analysed. The influence of health technologies on the immune system of preschool children is revealed. 4. Influence of health technologies on the nervous system of children. The nervous system of children is analysed. The influence of health technologies on the nervous system of preschool children is revealed. 5. Influence of health technologies on the digestive system of children. The digestive system of children is analysed. The influence of health technologies on the digestive system	4

	of preschool children is revealed. 6. Influence of health technologies on children's excretory system. The excretory system of children is analysed. The influence of health technologies on the excretory system of preschool children is revealed. 7. Influence of health technologies on children's musculoskeletal system. The musculoskeletal system of children is analysed. The influence of health technologies on the musculoskeletal system of preschool children is revealed. ***Literary sources*** **Main:** [2].	
5.	***Module II. Methodological guidance on the use of diagnostic methods to determine the physical development of preschool children.*** ***Content module 2.1.*** **Lecture: Characteristics of physical development of preschool children and its control** Plan 1. The concept of physical development and its indicators. The concept of physical development of children is revealed, its characteristic indicators are determined. 2. Control over physical development: morphological (anthropometric) indicators. The characteristic of morphological (anthropometric) indicators of physical development is given. 3. Control over physical development: somatoscopic indicators. The characteristic of somatoscopic indicators of physical	4

	development is given. 4. Control over physical development: physiometric (functional) indicators. The characteristic of physiometric (functional) indicators of physical development is given. 5. Control over the state of health of children. The classification of health groups and peculiarities of distribution of children by groups are given. ***Literary sources*** **Main:** [1; 2].	
6.	***Module III. Methodological guidance on the use of diagnostic methods to determine the health status of preschool children*** ***Content module 3.1.*** **Lecture: Formation of correct posture and arch of the foot as an indicator of physical development of preschool children** Plan 1. Features of posture formation in children. The types of posture disorders are determined and methods of diagnosing disorders are analysed. 2. Features of the formation of the arch of the foot in children. The types of disorders of the foot arch are determined and the methods of diagnosing disorders are analysed. ***Literary sources*** **Main:** [1;2].	4
7.	**Lecture: Additional examination of the health status of preschool children in the conditions of preschool education institutions**	

	Plan 1. Examination of the correspondence of the biological age of preschool children to the passport age. The importance of determining the biological age of children and comparing it with their passport age is described. 2. Determination of children's body resistance (body resistance to negative factors). The body's resistance to the effects of pathogenic and damaging factors is determined by analysing the number of acute respiratory infections during the year. 3. Determination of children's body reactivity (degree of body resistance to adverse effects). The degree of resistance of the body to the adverse effects of the environment is determined by analysing the number of ARI and ARVI during the year. 4. Determination of physical performance of children. The physical performance of the body is assessed, the formula of the Rufier test is given in order to determine the performance of the child's heart. 5. Study of adaptive reactions of children's organism. The adaptive reactions of children's organism are revealed and characterised, which is so necessary when planning work in preschool education institutions. 6. Determination of psychophysical state of preschool children. ***Literary sources*** **Main:** [2]. **Additional:** [1]. **Internet sources:** [3;4].	
	Module IV. Methodological guidance for monitoring	

8.	***children's physical development*** ***Content module 4.1.*** **Lecture: Control over the physical development of preschool children** Plan 1. Methods of determining the level of development of children's motor (physical) qualities. The motor qualities of children are characterised and methods of their diagnostics in preschool children are presented. 2. Assessment of children's motor fitness. The basic movements of children are characterised and methods of their diagnostics in preschool children are presented. 3. Control over physical education classes. Physical training is characterised and methods of its diagnostics are presented. ***Literary sources*** **Main:** [1;2;3].	4
	In total for 6,7 f-t.s. semester	30

Content of practical classes

№	List of topics of practical classes, their annotations	Number of hours f-t.s.

1.	***Module I.*** ***Content module 1.1.*** **Topic: Implementation of health technologies in the educational and recreational activities of preschool children** Plan 1 The concepts of "technology", "health-saving technologies", "health technologies". 2. The use of innovative health technologies to preserve and improve the health of preschool children. 3. Health technologies with preventive and therapeutic purposes in the practice of work of preschool education institutions with preschool children. 4. Influence of therapeutic health technologies on physical and mental development of preschool children. ***Literary sources*** **Main:** [2]. **Additional:** [2;3;4;5;6;8;9;10;11;12;13]. **Internet sources:** [1;2].	6
2.	**Topic: History of the origin and development of health technologies** Plan 1. The history of the development of innovative health technologies (fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics). 2. History of the development of preventive and therapeutic health technologies (aromatherapy, phytotherapy, vitamin therapy). 3. The history of the origin and development of therapeutic health technologies (bibliotherapy, laughter therapy, music	6

	therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy). ***Literary sources*** **Main:** [2]. **Additional:** [3;4;6]. **Internet sources:** [1;2].	
3.	**Topic: Methods of conducting health technologies with preschool children** Plan 1. Methods of conducting innovative health technologies; fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics. 2. Methods of conducting preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy. 3. Methods of conducting therapeutic health technologies: bibliotherapy, laughter therapy, music therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy. ***Literary sources*** **Main:** [2]. **Additional:** [4;5;6;7;8;9;12;13]. **Internet sources:** [1;2].	6
4.	**Topic: Influence of health technologies on the body of preschool children** Plan 1. Influence of health technologies on the respiratory system of children.	6

	2. Influence of health technologies on the cardiovascular system of children. 3. Influence of health technologies on the immune system of children. 4. Influence of health technologies on the nervous system of children. 5. Influence of health technologies on the digestive system of children. 6. Influence of health technologies on the excretory system of children. 7. Influence of health technologies on children's musculoskeletal system. ***Literary sources*** **Main:** [2].	
5.	***Module II.*** ***Content module 2.1.*** **Topic: Characteristics of physical development of preschool children and its control** Plan 1. The concept of physical development and its indicators. 2. Control over physical development: morphological (anthropometric) indicators. 3. Control over physical development: somatoscopic indicators. 4. Control over physical development: physiometric (functional) indicators. 5. Control over children's health. ***Literary sources*** **Main:** [1;2].	6
	Module III. ***Content module 3.1.***	

6.	**Topic: Formation of correct posture and arch of the foot as an indicator of physical development of preschool children** Plan 1. Features of posture formation in children. 2. Features of the formation of the arch of the foot in children. ***Literary sources*** **Main:** [1;2].	6
7.	**Topic: Additional examination of preschool children's health status in the conditions of preschool education institutions** Plan 1. Examination of the correspondence of the biological age of preschool children to the passport age. 2. Determination of children's body resistance (body resistance to negative factors). 3. Determination of reactivity of children's organism (degree of resistance to adverse effects). 4. Determination of physical performance of children's organism. 5. Study of adaptive reactions of children's organism. 6. Determination of psychophysical state of preschool age children. ***Literary sources*** **Main:** [2]. **Additional:** [1]. **Internet sources:** [3;4].	4
	Module IV. ***Content module 4.1.***	
8.	**Topic: Control over the physical development of preschool**	

	children Plan 1. Methods of determining the level of development of motor (physical) qualities of children. 2. Assessment of children's motor fitness. 3. Control over physical education classes. ***Literary sources*** **Main:** [1;2;3].	6
	In total for 6,7 f-t.s. semester:	**46**

Content of the independent work

Topic number	List of topics and issues of independent work, their annotations	Number of hours Independent work of the student f-t.s.
Topic 1 **Implementation of health technologies in the educational and recreational activities of preschool children.**	***Module I Theoretical foundations of the course «health technologies and diagnostic methods of physical education of children» and methodological guidance on the use of health technologies in work with children.*** ***Content module 1.1.*** ***Tasks for independent work:*** 1) study the lecture material on the topic. 2) select complexes of finger gymnastics (3 pcs. pieces) for preschool age children: one complex for children of the second junior group, 1 - for middle group, 1 - for senior group. 3) write complexes of fitball gymnastics (3	13

	pieces), breathing (3 pieces), sound (3 pieces) gymnastics for children: one complex for children of the second junior group, 1 - middle, 1 - senior. 4) practical performance of different types of gymnastics and therapy by students.	
Topic 2 **History of the origin and development of health technologies.**	***Tasks for independent work:*** 1) study the lecture material on the topic. 2) make a chronological table of the history of the development of health technologies by type: innovative, preventive and therapeutic, therapeutic (in the table). 3) prepare a presentation on the topic.	13
Topic 3 **Methods of conducting health technologies with preschool children.**	***Tasks for independent work:*** 1) study the lecture material on the topic. 2) describe in the table the methodology of each health technology. 3) write outlines of classes for children of different ages (on speech development and culture of speech communication, acquaintance with the natural environment, artistic and productive activities, sensory development (for young children) and logical and mathematical development (for preschool children) using health technologies combined with each other.	13
Topic 4 **Influence of health**	***Tasks for independent work:*** 1) study the lecture material on the topic.	13

technologies on the body of preschool children.	2) select medicinal herbs to affect the cardiovascular, respiratory, nervous, digestive, and excretory systems; 3) develop guidelines for the use of aromatic oils on the cardiovascular, respiratory, nervous, digestive, excretory systems; 4) describe characteristics of influence of health technologies on all systems of children's organism (in the table).	
Topic 5 **Characteristics of physical development of preschool children and its control.**	***Module II. Methodological guidance on the use of diagnostic methods to determine the physical development of preschool children.*** ***Content module 2.1.*** ***Tasks for independent work:*** 1) study the lecture material on the topic; 2) conduct research on morphological (somatometric) indicators: measurements of body weight, height and chest circumference of preschool children (group of choice) and compare them with the average, draw conclusions; 3) conduct a study on dental indicators: the shape of the chest, limbs; the degree of fat deposition; 4) carry out research on physiometric (functional) indicators: the state of the cardiovascular system, muscle strength of the hands (dynamometry).	13

Topic 6 **Formation of correct posture and arch of the foot as an indicator of physical development of preschool children.**	***Module III. Methodological guidance on the use of diagnostic methods to determine the health status of preschool children.*** ***Content module 3.1.*** ***Tasks for independent work:*** 1) study the lecture material and prepare for practical activities; 2) determine the posture of preschool children (by several methods) (group of choice), to analyse its disorders; 3) determine the state of the arch of the foot in preschool children (by several methods) (group of choice), to analyse its disorders.	13
Topic 7 **Additional examination of the health status of preschool children in the conditions of preschool education institutions.**	***Tasks for independent work:*** 1) study the lecture material and prepare for practical activities; 2) conduct an examination of children's body resistance (group of your choice); 3) analyze the morbidity status of preschool children, determine the number of chronic and infectious diseases (group of choice).	13
Topic 8 **Control over the physical development of preschool children.**	***Module IV. Methodological guidance for monitoring the physical development of children.*** ***Content module 4.1.*** ***Tasks for independent work:*** 1) work out the lecture material; 2) determine the level of development of physical qualities in preschool children (group of choice);	13

	3) assess the motor readiness of preschool children (group of choice).	
	In total for 6,7 f-t.s. semester:	**104**

Questions for the credit test in the course "Health technologies and diagnostic methods of physical education of children".

1. The concepts of "technology", "health-saving technologies", "health technologies".
2. The use of innovative health technologies to preserve and improve the health of preschool children.
3. Health technologies with preventive and therapeutic purposes in the practice of work of preschool education institutions with preschool children.
4. Influence of therapeutic health technologies on physical and mental development of preschool children.
5. History of the development of fitball gymnastics.
6. History of the development of breathing gymnastics.
7. History of the development of sound gymnastics.
8. History of the development of immune gymnastics.
9. History of the development of finger gymnastics.
10. History of the development of psychogymnastics.
11. History of the aromatherapy development.
12. History of the development of phytotherapy.
13. History of the development of vitamin therapy.
14. History of the development of bibliotherapy.
15. History of the development of laughter therapy.
16. History of the development of music therapy.
17. History of the development of art therapy.
18. History of the development of kinesitherapy.

19. History of the development of reflexology.
20. History of the development of game therapy.
21. The history of the developmentof colour therapy.
22. History of the development of fitball gymnastics.
23. History of the development of breathing gymnastics.
24. History of the development of sound gymnastics.
25. History of the development of immune gymnastics.
26. History of the development of finger gymnastics.
27. History of the development of psychogymnastics.
28. History of development of hydro aerobics.
29. History of the development of aromatherapy.
30. History of the development of phytotherapy.
31. History of the development of vitamin therapy.
32. History of the development of bibliotherapy.
33. History of the development of laughter therapy.
34. History of the development of music therapy.
35. History of the development of art therapy.
36. History of the development of kinesitherapy.
37. History of the development of reflexology.
38. History of the development of game therapy.
39. History of the development of sand therapy.
40. History of the development of colour therapy.
41. Influence of innovative health technologies on the cardiovascular, nervous, digestive, excretory, musculoskeletal systems of children.
42. Influence of health technologies with preventive and therapeutic purposes on the cardiovascular, nervous, digestive, excretory, musculoskeletal systems of children.
43. Influence of health technologies of therapeutic purpose on cardiovascular, nervous, digestive, excretory, musculoskeletal systems of children.
44. The concept of physical development and its indicators

45. Control over physical development: morphological (anthropometric) indicators.

46. Control over physical development: somatoscopic indicators.

47. Control over physical development: physiometric (functional) indicators.

48. Control over children's status health.

49. Features of posture formation in children.

50. Features of the formation of the arch of the foot in children.

51. Examination of correspondence of biological age of preschool children to passport age.

52. Determination of children's body resistance (body resistance to negative factors).

53. Determination of reactivity of children's organism (degree of resistance of organism to adverse influence).

54. Determination of physical performance of preschool age children.

55. Study of adaptive reactions of preschool age children's organism.

56. Determination of psychophysical state of preschool age children.

57. Methods of determination of the level of development of motor (physical) quality – speed in preschool age children.

58. Methods of determination of the level of development of motor (physical) quality – agility in preschool age children.

59. Methods of determination of the level of development of motor (physical) quality – strength in preschool age children.

60. Methods of determination of the level of development of motor (physical) quality – endurance in preschool age children.

61. Methods of determination of the level of development of motor (physical) quality – flexibility in preschool age children.

62. Assessment of children's motor fitness: examination of walking.

63. Assessment of children's motor fitness: examination of running.

64. Assessment of children's motor fitness: examination of jumps.

65. Assessment of children's motor fitness: examination of throwing.

66. Control over physical culture classes.

Practical tasks

1. Write finger exercises for preschool children.
2. Write a set of fitball gymnastics.
3. Write a set of breathing exercises.
4. Write a set of sound gymnastics.
5. To reveal the influence of green and blue colours on the organism of children and to define the ways of their application.
6. Reveal the influence of yellow and orange colours on the organism of children and define the ways of their application.
7. Reveal the influence of red and white colours on the organism of children and define the ways of their application.
8. Reveal the influence of blue and brown colours on children's organism and define the ways of their application.
9. Reveal influence of violet and pink colours on children's organism and define the ways of their application.
10. Select medicinal herbs to calm children's bodies.
11. Select aromatic oils to prevent colds in children and reveal the method of their application.
12. Select aromatic oils to soothe the body of children and reveal the method of their application.
13. Methods of examination of general and motor density of the class.
14. Develop recommendations for parents to prevent the appearance of posture disorders.
15. Develop recommendations for parents on prevention of flat feet.
16. Select medicinal herbs for influence on cardiovascular, respiratory, nervous, digestive, excretory systems.
17. Select aromatic oils for influence on cardiovascular, respiratory, nervous, digestive, excretory systems.

Criteria for assessment students' knowledge

in "Health technologies and diagnostic methods of physical education of children" for Bachelor's degree programme

CTS assessment	The sum of points on a 100-point scale	National assessment
A	**90-100**	Student: - gives correct, accurate, complete and thorough answers; - demonstrates a high level of knowledge in the scope of the curriculum on health technologies and diagnostic techniques; - uses modern scientific terminology; - methodically competently solves the proposed tasks; - is creative in solving tasks; - is well-versed in the system of methodological concepts, scientifically correctly interprets them; - reveals topical issues of the methodology of teaching health technologies and the use of diagnostic techniques, connects them with related disciplines; - has practical skills; - the given fragment of the class is characterised by independence, creativity, illustrated by his/her own examples or examples from the experience of well-known methodologists or educators in Ukraine; - the high culture of written professional speech is observed. - all assignments are completed, the student thoroughly and fully presents the content of theoretical material, shows full understanding of it, substantiates his/her thoughts, provides the necessary

			examples, presents the material consistently and correctly in terms of the norms of the literary language; - perfectly masters the methodology of applying health technologies, combines them with each other.
B	**82-89**		Student: - the answer is not complete enough, but meaningful; - has good theoretical knowledge of health technologies and diagnostic techniques; - is aware of the system of methodological concepts, but makes some minor mistakes in their interpretation; - reveals some topical issues of teaching health technologies in preschool education institution, connects with related disciplines; - minor mistakes are made when performing methodological tasks; - partially has command of certain health technologies and diagnostic methods; - illustrates the given fragment of the class with his/her own examples or examples from the experience of well-known methodologists or educators in Ukraine; - makes minor mistakes; - dentifies theoretical knowledge, supports it with examples, but lacks creative interpretation; - scientific terminology is used correctly and appropriately; - at least 3\4 % of the task is completed and the

		student gives an answer that meets the same requirements as for the grade "5", but makes some mistakes and isolated shortcomings in the sequence of presentation of the material on the theoretical question of the work; - makes some methodological errors in the application of health technologies and their combination with each other.
C	**74-81**	Student: - the answer is not complete enough, but meaningful; - has good theoretical knowledge of health technologies and diagnostic techniques; - is aware of the system of methodological concepts, but makes frequent minor mistakes in their interpretation; - reveals some topical issues of teaching health technologies and diagnostic methods in preschool educational institution, connects with related disciplines; - frequent mistakes are made when performing methodological tasks; - has command of certain health technologies and diagnostic methods; - illustrates the given fragment of the class with his/her own examples or examples from the experience of well-known methodologists or educators in Ukraine; - makes minor mistakes; - identifies theoretical knowledge, supports it with examples, but lacks of their creative interpretation;

		- scientific terminology is used correctly and appropriately; - at least 3\4 % of the task is completed and the student gives an answer, but makes some mistakes and isolated shortcomings in the sequence of presentation of the material on the theoretical question of the work; - makes some methodological mistakes in the application of health technologies and their combination with each other.
D	**64-73**	Student: - the answer is not complete enough; - makes mistakes in the definition of methodological concepts; - demonstrates knowledge of health technologies and diagnostic techniques at the level of general acquaintance; - the given fragment of the class violates certain methodological norms; - does not provide own examples; - lack of creativity in solving problems; - does not know how to substantiate his/her thoughts; - at least half of the assignment is completed and the student shows knowledge and understanding of the main concepts of the theoretical issue, but the material is not complete enough, makes mistakes; - in some formulations, does not know how to deeply and convincingly substantiate his/her thoughts, does not provide the necessary examples; - presents the material inconsistently and makes mistakes in the work.

E	**60-63**	Student: − the answer is not complete enough; - makes a mistake in defining methodological concepts; - demonstrates knowledge of health technologies and diagnostic techniques at the level of general acquaintance; - the given fragment of the class violates certain methodological norms; - does not provide own examples; - lack of creativity in solving problems; - does not know how to substantiate his/her thoughts; - at least half of the assignment has been completed and the student demonstrates knowledge and understanding of the main concepts of the theoretical issue, but the material is not complete enough, and mistakes are made; - in certain formulations, is unable to substantiate his/her thoughts in a deep and convincing manner, does not provide the necessary examples; - presents the material inconsistently and makes mistakes in the work.
FX	**35-59**	Student: - shows ignorance of theoretical material on health technologies and diagnostic techniques or its superficial presentation; - key issues are incompletely revealed; - makes mistakes in defining methodological concepts; - is not familiar with the peculiarities of teaching preschool children health technologies and

			diagnostic methods; - does not provide examples; - makes significant mistakes in solving specific methodological tasks; - does not use scientific terminology; - lack of creativity in solving problems; - has a low culture of oral communication; - more than half of the assignment is not completed; - the student shows ignorance of most of the answer to the question, inconsistently presents theoretical material, does not provide the necessary examples, makes mistakes in the work; - does not know how to apply health technologies and combine them with each other.
F	**1-34**		Student: - shows ignorance of theoretical material on health technologies and diagnostic techniques; - key issues are not disclosed; - makes mistakes in defining methodological concepts; - is not familiar with the peculiarities of teaching preschool children health technologies and diagnostic methods; - does not give examples; - makes significant mistakes in solving specific methodological tasks; - does not use scientific terminology; - lack of creativity in solving problems; - has a low culture of oral communication; - more than half of the assignment is not

		completed; - the student shows ignorance of most of the answer to the question, inconsistently presents theoretical material, does not provide the necessary examples, makes mistakes in the work; - does not know how to apply and combine health technologies.

Scale of assessment

Table 1

Distribution of points within the academic course from which the form is provided final control – exam (full-time studying)

Auditory work									**Independent, individual work**	**Modular control**	**Form semester certification - credit test**
Maximum number of points − 60									Maximum number of points – 10	Maximum number of points – 20	Maximum number of points – 10
2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	1.25 points for each of the 8 topics	Modular control 1 – 10 points Modular control 2 – 10 points	
2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6	2,6			
2,6	2,6	2,6	2,6	2,6							

Determination of the final grade according to Table 2 on the national and ECTS scales:

Table 2

Correspondence of assessment scales (national and European (ECTS))

ECTS assessment	National assessment
1	2
A	High level of theoretical knowledge and practical skills
B	Sufficient level of mastery of the knowledge of the educational material, skills of their practical implementation
C	Medium-sufficient level of mastery of theoretical material and readiness to use the acquired skills
D	Average level of theoretical knowledge and practical skills
E	The level of mastery of theoretical material, practical skills and abilities is below average
FX	Low level of mastery of educational material, the student is not able to master practical skills without additional classes in the discipline
F	Low level of knowledge of the discipline, lack of practical skills, which is the reason for repeated study of the discipline

Distribution of points and evaluation criteria within the academic course (full-time studying)

2,6 points (oral answer), 2,6 (IWS), 10 points (exam). A high level of possession of theoretical knowledge and practical skills, in particular, the student: - gives correct, accurate, complete thorough answers supported by examples and presentation of his own position; - demonstrates a high level of knowledge in the scope of the curriculum, which he obtained by using the main and auxiliary literature, in particular articles in professional publications; - uses modern scientific terminology; - methodically competently solves the proposed tasks; - approaches tasks creatively; - orients himself in the system of methodical concepts, interprets them scientifically correctly; - comprehensively discloses current issues, connects them with related disciplines; - possesses modern technologies of rehabilitation; - methodically competently develops lesson notes, etc.; - adheres to a high culture of

written professional speech; - performs all tasks of independent work on time and with high quality.

2,3 points (oral answer), 2,08 (IWS), 8 points (exam). A sufficient level of mastery of the knowledge of the educational material, the skills of their practical implementation, in particular, the student: - answers the questions of all topics of the discipline not complete enough, but meaningful, supported by examples and own judgments; - well versed in theoretical knowledge obtained from the main literature and some specialized publications; - is guided by the system of methodical concepts, but single insignificant errors in their interpretation are assumed; - discloses specific topical issues, connects them with related disciplines; - during performance of methodical tasks, in particular, development of lesson notes, etc., makes minor mistakes; - possesses separate modern technologies of rehabilitation; - completed at least 90% of independent work tasks.

2 points (oral answer), 1,56 (IWS), 6 points (exam). The average level of possession of theoretical knowledge, practical abilities and skills, in particular, the student: - the answer to the main questions of the course is insufficiently complete; - presents a superficial presentation of the material on the main topics; - reveals the key issues incompletely, mainly presents the material of the main manual or the lecture outline; - makes a mistake in defining basic methodological concepts; - he is not familiar with modern technologies of health improvement, which are used in the practice of work of preschool institutions; - does not give examples; - makes significant mistakes in solving specific methodical tasks; - does not use scientific terminology; - there is no creative approach in solving tasks; - has a low culture of oral and written communication.

1,5 points (oral answer), 1,04 (IWS), 4 points (exam). Satisfactory level of possession of theoretical material, practical abilities and skills is defined as below average, in particular, the student: - the answer to the main questions of the discipline is insufficiently complete; - presents ignorance of the material on the main topics; - reveals the key issues incompletely, mainly presents the outline of the lecture; - makes a mistake in defining basic methodological concepts;

- he is not familiar with modern technologies used in the practice of work of preschool institutions; - does not give examples; - makes significant mistakes in solving specific methodical tasks; - does not use scientific terminology; - there is no creative approach in solving tasks; - has a low culture of oral and written communication; - does not perform more than half of the tasks of independent work; - makes gross methodical errors during the development of lesson notes; - does not know how to competently analyze the content of programs.

1 point (oral answer), 0,52 points (IWS), 2 points (exam). Low level of mastery of educational material: the student does not fully explain the key questions, while using information from the main literary sources or the synopsis; makes mistakes in the definition of methodological concepts, and does not know most of the definitions; is not familiar with modern technologies of health improvement, which are used in the practice of work of preschool institutions; makes significant mistakes in solving specific methodical tasks, drawing up lesson notes, etc.; does not use scientific terminology; there is no creative approach in solving practical tasks; teaches theoretical material inconsistently, does not give the necessary examples, makes many mistakes; does not know how to correctly develop an outline of a class or other form of work with children on a specific topic; unable to master practical skills without additional training in the discipline.

Literary sources for the course

Main:

1. Vilchkovsky E.S., Kurok O.I. Theory and methods of physical education of preschool children. Sumy: VTD University Book, 2019. 436 p.

2. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

3. Diagnostic methods for assessing the physical condition of preschool children and preventive exercises to improve it: a textbook. 2nd edition, supplemented / authors-compilers E.S. Vilchkovskyi, O.I. Kurok, N.O. Khlus. Vinnytsia: Tvory LLC, 2023. 63 p.

Additional:

1. Barriers. Phagocytosis: methodical instructions for the discipline "Pathological Physiology" for bachelor students (speciality "Nursing") / compiled by. O.V. Nikolaieva, O.M. Shevchenko, O.O. Pavlova and others. Kharkiv: KHNMU, 2016. 12 p.

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CHAPTER 3. LECTURE MATERIAL

Lecture 1-2: Implementation of health technologies in educational and recreational activities of preschool children

Plan

1. The concepts of "technology", "health-saving technologies", "health technologies".

2. Use of innovative health technologies to preserve and improve the health of preschool children.

3. Health-improving technologies for preventive and therapeutic purposes in the practice of work of preschool education institutions with preschool children.

4. Influence of therapeutic health technologies on physical and mental development of preschool children.

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1. Numerous studies conducted in the field of strengthening and improving the health of preschool children only confirm the actuality of our issue. Most scientists are convinced that in order to preserve and improve the health of preschool children, pedagogues need to widely use health technologies in their work. Let us turn to the essence of the concept of "technology".

Today, scientists and practitioners are increasingly using the term "technology". Initially, in pedagogy, the term "technology" was associated only with the use of

technology - technical teaching aids. Nowadays, this term is associated with the concept of "pedagogical technology".

In the dictionary, we find the following definition of the concept of "technology" – a set of knowledge, information about the sequence of certain production operations in the process of producing something. In pedagogy, the concept of "technology" is most often used to refer to the consistent application of various techniques that ensure the solution of a given pedagogical task and are included in the concept of "pedagogical technology", which has several definitions.

Although most authors, when considering technology, pay attention to the guaranteed end result in the course of performing certain actions, V. Kukushyn notes that the same technology in the hands of different teachers may look different (it all depends on the personal qualities of the pedagogue, students, psychological microclimate in the group, mood, etc.) In addition, the results will have some differences. In order for pedagogues to successfully, appropriately and correctly apply various health-saving technologies in order to form, preserve and strengthen the health of their trainees, it is necessary to consider their types and classifications that exist in pedagogy.

According to O. Vashchenko's research, the following types of technologies are used in the educational process of schoolchildren

- health-preserving (preventive vaccinations, ensuring physical activity, organisation of rational nutrition);

- health-improving (physical training, physiotherapy, aromatherapy, hardening, gymnastics, massage, herbal medicine, art therapy);

- health education technologies (valeological training);

- education of health culture (optional classes on the development of children's personality, extracurricular and out-of-school activities, competitions).

In addition, health-saving technologies have their own classification:

- *by the character of their activity*, they can be narrowly specialised and comprehensive (integrated). Complex health-saving technologies include technologies for comprehensive disease prevention, correction and rehabilitation of

health (physical education and health-improving; valeological); pedagogical technologies that promote health; technologies that form a healthy lifestyle;

- *by the direction of activity* they can be medical (technologies of disease prevention; correction and rehabilitation of somatic health; sanitary and hygienic activities); educational, which promote health (informational, educational and upbringing); social (technologies of organisation of healthy and safe lifestyle; prevention and correction of deviant behaviour); psychological (technologies of prevention and correction of mental deviations of personal and intellectual development).

In T. Karaseva's research, we find the following classification of health-saving technologies: medical and hygienic technologies; physical culture and health technologies; ecological health-saving technologies; technologies for ensuring life safety; health-saving educational technologies.

Recently, researchers (N. Denysenko, O. Bohinich, N. Levinets, K. Krutii, etc.) have been focusing on the use of health technologies in working with preschool children to improve their health (physical, mental, social and spiritual) and physical development, which are the most effective in terms of their impact on children's health. Their main feature is an integrated approach to solving health-saving problems, the use of psychological and pedagogical methods and techniques.

There are three subgroups of health technologies (according to N. Levinets): organisational and pedagogical technologies that determine the structure of the educational process, prevent fatigue, hypodynamia and other maladaptive conditions; psychological and pedagogical technologies related to direct professional activity, including psychological and pedagogical support of the educational process; educational technologies that include programmes to develop children's knowledge of the basics of a healthy lifestyle and health culture.

Ukrainian scientist O. Bohinich classifies health technologies in a slightly different way. She divides them as follows: innovative health technologies, health technologies for preventive and therapeutic purposes, therapeutic health technologies.

2. Among innovative health technologies for preschool children in PEI are: fitball gymnastics, artistic gymnastics, finger gymnastics (exercises, games, pictures),

breathing and sound gymnastics, immune gymnastics, hydroaerobics, psychogymnastics (exercises, games, sketches, pantomimes), etc.

Particular attention in physical education of preschoolers should be paid to the use of different types of gymnastics that contribute to the preservation of children's health – fitball gymnastics, breathing, sound, immune, artistic and finger gymnastics, psychogymnastics.

Fitball gymnastics is the performance of various gymnastic exercises with/on a large inflatable elastic ball of various diameters, colours and configurations, with a special surface that prevents slipping off the ball. The balls are of different types by configuration: with legs or orthopaedic (handles for balance, suitable for children); with horns, ears or arches or gymnastic (also suitable for children); with spikes or cones or massaging (have an additional function of a massager, can be used with children, but requires certain skills to use the ball); smooth or fitball (can be used for children both for relaxation and intensive training); special children's balls (small in size and colourful, can be used in work with children of early and preschool age). There are also oval and donut-shaped balls.

When choosing a fitball, you should pay attention to the following characteristics: the ball should correspond to the child's height (sitting on the ball, the angle between the body and legs, shin and foot should be 90°); the presence of horns, legs (handles) in accordance with the purpose of work and the child's training; be elastic; durable; of high quality (seams on the ball should not be visible, the nipple should not extend beyond the surface of the ball); have antistatic properties; have an anti-burst safety system, imported balls are marked ABS (Anti-Burst System) – anti-burst system (when they break, such balls slowly deflate rather than explode).

The use of breathing, sound (different pronunciation of sounds) and immune gymnastics makes it possible to strengthen the respiratory and cardiovascular systems of preschoolers in order to prevent colds, contributing to the strengthening of physical health; the use of artistic, finger gymnastics and psychogymnastics affects the development of children and helps to strengthen their mental health.

Breathing exercises are special exercises aimed at developing the respiratory muscles. When performing these exercises, you should always inhale through your

nose and exhale through your mouth. For greater effect, it is advisable to combine breathing exercises with sound exercises.

Breathing exercises are useful for children with respiratory diseases and cardiovascular disorders. Systematic breathing exercises help to strengthen the immune system, abdominal and back muscles, respiratory muscles, and chest development, which has a positive effect on the physical health of children. Special attention should be paid to breathing exercises by O. Strelnikova, which consists of 12 exercises. Its systematic implementation relieves fatigue, strengthens the immune system, respiratory system, and has a positive effect on posture and the body. You should start with the following exercises: "Palms", "Sprouts (Pogonchiki)", "Pump". After that, do the following exercises: "Cats", "Shoulder Hugs", "Big Pendulum", then "Ears", "Head Turns", "Small Pendulum", and finally, we do the exercises: "Rolls", "Steps".

Sound gymnastics is the pronunciation of individual sounds or their combination, imitation of animals, birds, transport, during which the vibration of the vocal cords is transmitted to the smooth muscles of the bronchi and lungs, and through them to the chest, relieving spasms of the bronchi and bronchioles. The strength of the vibration depends on the strength of the air exhaled during the pronunciation of sounds. In view of this, there are three groups of consonant pronunciation: maximum stress occurs when pronouncing deaf consonants (p, t, k, f, tc); medium stress – when pronouncing voiced consonants (b, d, g, v, z); low stress – when pronouncing sonorous consonants (m, n, l, p). Sounds are also divided into special consonants according to the following classification: buzzing (zh, z); whistling (s, z, ts, dz) and hissing (ch, sh, zh, j); shaking (r).

Sound gymnastics helps to prevent colds, strengthen abdominal muscles, improve the functioning of the respiratory and cardiovascular systems, and the stomach, which has a positive effect on physical health. It will be especially useful for children with bronchial asthma, respiratory diseases accompanied by bronchial spasm, and obstructive bronchitis.

Immune gymnastics are exercises that are performed with the coordination of breathing and body movements, with a combination of acupressure.

Immune gymnastics strengthens the body, preschoolers' immunity, respiratory and cardiovascular systems, increases tonus, improves the functioning of internal organs, blood circulation, psychomotor coordination, saturates the brain with oxygen, increases the body's resistance to adverse factors in order to prevent colds, which helps to improve physical health. It also helps to achieve balance, peace of mind, gives lightness, energy, vigour, well-being and mood, which contributes to mental health.

Finger exercises are exercises, games, and pictures performed to develop finger flexibility, small muscles of the hand, and to relax and rest tense muscles.

Finger gymnastics has a positive effect on the functioning of the brain, internal organs, helps to calm down, concentration of attention, develop mental processes, small muscles of the child's hand, improve mood, physical and mental health through exposure to biologically active points.

Psychogymnastics is a special training (exercises, sketches, games) that uses movements, facial expressions, gestures to influence the development and correction of various aspects of the child's psyche - his or her cognitive, emotional and volitional spheres.

Psychogymnastics is used to relieve emotional and physical tension in children after physical education classes, work activities and to balance the processes of excitation and inhibition. It is also used with children who have excessive mobility or motor inhibition, poor concentration, timidity, and withdrawal. The systematic use of psychogymnastics affects the development of children and helps to strengthen their mental health.

Hydroaerobics (aqua aerobics) is the use of a set of exercises in water with or without equipment. This kind of gymnastics has a double effect on children's bodies: aerobics exercises themselves and the water environment in which they are performed.

Hydroaerobics has a positive effect on the muscles, organs and systems of children's bodies, improves mood, well-being, respiratory and cardiovascular systems, and contributes to the development of physical qualities and hardening. However, the only condition for such gymnastics is the availability of a swimming

pool (pond in summer), but, unfortunately, not all preschool education institutions have this opportunity.

3. Health technologies for preventive and therapeutic purposes, among which we can distinguish the following: phytotherapy (teas, cocktails, phytobags); aromatherapy (aromatisation of the room); vitamin therapy (vitaminisation of dishes).

Recently, health technologies such as aromatherapy and phytotherapy have become widespread in the physical education of preschool children in order to preserve and strengthen their health. It is advisable to conduct them in periods critical for the formation and progression of deviations in children's health: during adaptation to preschool education, increasing frequency of colds and flu, for children who are often ill.

Aromatherapy is the effect on the body of essential oils through the respiratory tract, skin, mucous membranes by means of a bath, massage, inhalation, inhalation of vapours indoors. This type of therapy requires prior permission from parents and a doctor (if necessary). When using aromatherapy, it is important to start it long before the period of increasing colds, taking into account individual characteristics (state of health, well-being, mood, allergies) and the child's perception of essential oils.

It is known that essential oils, which are the basis of aroma oil, have anti-inflammatory, soothing, antimicrobial, antiviral, tonic, analgesic effects, and at the same time they have a positive effect on the activity of the nervous (calming or excitement) and cardiovascular systems, promote the expansion of blood vessels in the brain, and lower blood pressure. If you choose the right aroma oil, you can achieve the desired result. In addition to its calming and stimulating effects, aroma oil also has a phytoncidal effect (it destroys bacteria and viruses, enriches the air in the room with ions). Houseplants also have a phytoncidal effect, as they also purify the air from harmful substances. For example, geraniums kill staphylococci and streptococci; chlorophytum, tradescantia, laurel, rosemary, aglaonema, conifers, citrus, dwarf ficus, myrtle destroy viruses and bacteria. In addition, conifers and croton saturate the air with ions. Plants such as chlorophytum, tradescantia, ficus, dracaena, ivy, spathiphyllum and others purify the air from negative substances (phenol, toluene).

Essential oils activate the endocrine glands, regulate the immune system, increase blood circulation, and accelerate the processes of lipid peroxidation of biomembrane structures. The molecular structure of essential oils allows them to easily penetrate the skin epidermis, which makes them suitable for use in cosmetology. Essential oils can be used to cleanse the skin, soften it, eliminate dryness, oily sheen and acne, prevent hair loss, dandruff and improve hair growth. Aromatherapy is a useful and all-natural way to calm the nervous system, it can help to get rid of various types of ailments, create a comfortable and harmonious atmosphere to relieve stress and gain strength.

Oils affect the human body in two ways: their aroma penetrates the brain through the respiratory system and affects feelings, the nervous system and hormone production. In addition, through the skin, oils penetrate the circulatory system and perform their specific functions there: for example, disinfect, relieve cramps, etc.

Essential oils are formed and accumulated in the essential oil glands of the whole plant or in separate parts:

- in leaves – lemon balm, sage, eucalyptus, rosemary, lemongrass, geranium, mint, petitgrain;
- in fruits – cumin, fennel, cardamom, coriander, anise, dill, ajwain;
- orange, lemon, grapefruit and other citrus fruits in the peel;
- in the bark – cinnamon wood;
- in the wood – cedar, sandalwood, juniper, camphor;
- in the roots – valerian, angelica, parsley, vetiver, ginger, iris, dudnik, calamus;
- in flowers – jasmine, chamomile, rose, lily, daffodil, hyacinth, fragrant violet, white acacia, orange flowers;
- in buds – poplar, birch, clove;
- in resin – myrrh, pine, styrax tree.

Essential oils can accumulate in special structures on the surface of plant parts (glandular hairs of various types, essential oil glands, glandular spots) or inside plants (secretory cells, secretory tracts and tubules).

Plants or their parts that contain essential oils and are used to extract these

oils are called essential oil raw materials.

Maintaining and improving children's health is impossible without a healthy diet. Considering the fact that many children are often ill and have low haemoglobin, it is necessary to provide phytotherapy and additional vitaminisation of their diet.

Phytotherapy is the use of herbal teas and phytococktails based on the use of medicinal plants. When using phytotherapy, it is important to start it taking into account the chronic and periodic diseases of children, their individual characteristics (health, well-being, mood, allergies) and the child's perception of medicinal herbs.

Vitamin therapy is an additional intake of vitamins. It is used in PEI in the form of vitaminisation of children's meals: C-vitaminisation of third courses (ready-made compotes and teas) and additional consumption of juices (vegetable and fruit).

Vitamin therapy in preschool education institutions is carried out to strengthen the health of preschool children, especially it is recommended for weakened children who are often ill, with anaemia, after illnesses, after treatment of parasitic diseases (worm infestation), and with chronic diseases. When using it, an important rule is not to overuse vitamins in order not to harm the body.

4. Therapeutic health technologies: bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy, reflexology, sand therapy, game therapy, colour therapy, etc.

Reading helps preserve preschoolers' health, improve their health and mood. For this purpose, preschool education institutions use *bibliotherapy and fairy tale therapy* as a method of art therapy, i.e. reading stories, poems, humorous stories, humourous stories, fairy tales.

Reading books (novels, poems, short stories) affects the mental development of a child; it develops his or her thinking, memory, imagination, ability to draw conclusions, generalise, compare; it promotes the development of outlook, moral and volitional qualities; it enriches experience. Reading humorous stories makes children laugh, improving their mood and well-being, and this is laughter therapy. Reading fairy tales promotes the development of the child's inner world, mental processes

(thinking, memory, imagination, attention), the formation of moral and volitional qualities, correction of the psyche, affects children's behaviour, mind, emotions, speech (especially when retelling), vocabulary.

Aesthetic therapy – the use of the influence of various types of art, including music therapy, art therapy, kinesitherapy, etc. – contributes to the health improvement of children.

Music therapy is one of the types of art therapy that influences children through music. Music plays an important role in the physical education of preschool children, having not only an educational but also a therapeutic effect.

Teachers S. Shabutin, S. Khmil, and I. Shabutina believe that music therapy affects skin receptors, heart rate and pulse, digestion, energy and information potential of the body, skin temperature; reduces pain threshold, muscle tension; improves coordination of movements, memory, learning ability; activates the functions of the nervous system; regulates hormone secretion, blood pressure; stimulates emotions, mood, and fetal development. Music changes all the physiological systems of a child, enhances metabolism, increases or decreases muscle energy, changes breathing, blood pressure, and provides a physical basis for emotions. It also helps to enrich children's knowledge of the world around them, instil a love of music, teach them to listen and understand how and what music tells. Music therapy can solve problems related to deviations in physical and mental development, interpersonal communication, behaviour, motivation, attention; it is used for the prevention and psychocorrection of development, relieving aggression, anxiety, apathy.

Art therapy is a fairly new method of psychotherapy based on the use of art (drawing, construction, sculpture) to influence the psycho-emotional state of a child.

Since art therapy is aimed at developing a child's self-knowledge and self-expression, it is used for diagnostic purposes, helps to overcome barriers to communication, develop imagination, self-control, creativity, relieve mental stress, increased anxiety, fears, depression, phobias, increase self-esteem, and release aggression. According to A. Osipova, art therapy should be used in the following cases: when it is necessary to give an outlet to aggression and other negative feelings;

to facilitate the treatment process; to obtain a product for a diagnostic report; to develop artistic abilities and increase a child's self-esteem, etc.

The pedagogue M. Sokratov recommends art therapy for the following indications: existing difficulties in emotional development; stress, depression, decreased emotional tonus, lability, impulsiveness of emotional reactions; emotional deprivation of children, the child's experience of emotional isolation and feelings of loneliness; conflict interpersonal relationships; dissatisfaction with the family situation, jealousy of other children in the family; Increased anxiety, fears, phobias; negative self-concept, low disharmonious, incorrect self-esteem, low self-perception; uncoordinated twitching of various muscles (nervous tic), asymmetrical, uncoordinated, sudden movements, tremors (trembling) of the fingers; disharmonious, adiological speech, including various dysarthric disorders (stuttering).

Kinesitherapy (kinesis – movement) is a type of aesthetic therapy that involves the rehabilitation of children through various movements. These can be active and passive movements. Active movements include exercises of therapeutic gymnastics and outdoor games (for children), and passive movements include massage, exercises on special devices and simulators, stretching method.

Kinesiotherapy is recommended for children with central nervous system disorders, neurological disorders, cerebral palsy, muscular dystrophy, congenital malformations, respiratory tract, bronchial, lung diseases, headaches, sleep disorders, spinal curvature, overweight, after injuries and surgeries. It also helps to develop coordination, fine motor skills, eliminate spasms, improve innervation, and blood circulation.

Reflexology is the stimulation of the central nervous system and internal organs by affecting biologically active points. There are more than 800 points on the human body.

Reflexology is used for diseases of the digestive, endocrine, nervous, respiratory and cardiovascular systems, epilepsy, chronic fatigue, visual and hearing impairments, skin diseases, pain syndrome, delayed speech development in children, regular colds, allergies, stuttering, enuresis, restless sleep.

In addition to the above-mentioned health technologies, we should not forget

about game and sand therapy, which are types of art therapy.

Game therapy is a method of preventive and therapeutic influence on children and adults through games in order to normalise their physical, mental and emotional state.

Game therapy is recommended in the case of autism, problems and disorders of various nature (for example, communication problems, etc.), emotional and speech disorders, depression, anxiety, panic, low self-esteem, and family problems.

Sand therapy is a method of psychotherapy that involves the use of sand in working with children.

Sand therapy can be used in case of behavioural problems of various types, mental and speech developmental delays, fears, aggression, anxiety, withdrawal, shyness, communication difficulties, low self-esteem, cerebral palsy, autism, epilepsy, hyperactivity, neurotic and psychosomatic disorders, problems with peers and parents. It also relieves nervous tension, improves mood, evokes various associations, helps to express feelings and experiences, reveal individuality, activate creative abilities, develop mental processes, coordination of movements, fine motor skills, and spatial orientation.

Colour therapy is the use of colours in working with children and is a type of art therapy.

Colour therapy has a positive effect on the psycho-emotional state, speeds up or slows down the heartbeat, stimulates or suppresses the secretion of hormones, improves the functioning of internal organs, mood, and well-being. It can be used in the form of drawing, interior decoration, clothing, household items, furniture, etc.

Lecture 3: History of the origin and development of health technologies

Plan

1. The history of the development of innovative health technologies (fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics).

2. The history of the development of preventive and therapeutic health technologies (aromatherapy, phytotherapy, vitamin therapy).

3. The history of the origin and development of therapeutic health technologies (bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy).

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1. The history of the development of fitballs began 60 years ago, when Italian manufacturing engineer Aquilino Cosani first launched a new technology for the production of large, durable balls in 1963. Since then, the use of fitballs has become widespread. English physiotherapist Elseth Kong developed a programme of neurological rehabilitation for children using fitballs.

This type of therapy became especially popular in Switzerland. The British physiotherapist Mary Quinton, who worked in Switzerland, began using fitballs in her work with newborns and infants. And Swiss physiotherapist Susan Klein-Vogelbach pioneered the use of fitballs as a therapeutic tool for the rehabilitation of patients with spinal injuries, and later used them in work with people with cerebral palsy. Gymnastics with fitballs became so effective in treating diseases that in 1980 she published a paper entitled "Ball Gymnastics for Functional Kinetics". All of this contributed to the spread of fitball gymnastics in America, where American physiotherapist Joan Posner Mauer began using fitballs in 1989 to rehabilitate the musculoskeletal system after injuries. Gradually, they moved from treating diseases to preventing them. Fitball gymnastics has become widespread in preschool

education institutions over the past 30 years.

Breathing exercises have been of great importance since the times of Ancient India, China, and Tibet, as proper breathing was and is one of the principles of good health in Eastern medicine. However, in its modern form, breathing exercises originate from the emergence of breathing techniques by K. Buteyko (exercises based on superficial breathing), B. Tolkachev (exercises with pronouncing different sounds; exercises with active hand movements while pouring water, breathing through the mouth), O. Strelnikova (exercises based on deep breathing, inhaling through the nose, exhaling through the mouth), and healthy breathing according to the yoga system. O. Strelnikova's breathing exercises were developed by opera singer and theatre teacher Oleksandra Mykolaivna Strelnikova in the 30s and 40s of the twentieth century, and in 1972 this method was patented. Breathing exercises have been used in preschool education institutions for the last 20-30 years.

It is difficult to say when exactly sound gymnastics originated historically, as the analysis of literary sources showed the absence of any references. However, its effectiveness has been proven in practice, so it is widely used in work with preschool children. Sound gymnastics has been used in preschool education institutions for the last 20 years.

It is difficult to say when exactly immune gymnastics originated historically, because the analysis of literature sources showed the absence of any references. However, its effectiveness has been proven in practice, so it is widely used in work with preschool children. Immune gymnastics has been actively used in preschool education institutions for the last 15-20 years.

The history of finger exercises dates back to ancient times, when folk pedagogy advised to conduct such exercises as "The Crow of the Magpie", "Forge, forge a boot", etc. with infants in order to influence their thinking and mind. The ancient Greek philosopher Aristotle emphasised that the hand is the tool of all tools. Later, well-known pedagogues and thinkers of the past, such as J.-J. Rousseau and I. Kant, pointed out the importance of the hand for the development of a child, and V. Sukhomlynskyi drew attention to the dependence of mental development and speech of a child on the motor skills and skill of his or her hand. In preschool education

institutions, finger gymnastics has been widely used for the last 30 years.

As an independent type of psychocorrection, psychogymnastics was proposed by G. Yunova in 1979. These were exercises for teenagers. Later, M. Chistyakova proposed a technique for younger children. In the work of the psychologist, this method of psychotherapy was very common. Since then, it has been developing and has become widespread. Psychogymnastics has been widely used in preschool education institutions for the last 30 years.

The ability to swim dates back to the times of the primitive social system, and later in Ancient Egypt, Greece, Rome, and China, this skill was widely valued. In the Middle Ages, swimming was not given much importance, and only in the Renaissance did it become a necessary and useful skill. At the beginning of the twentieth century, figure dances in the water with musical accompaniment were common in the United States for propaganda purposes. Aqua aerobics, or water gymnastics, first appeared in the US in the 1950s and was demonstrated by Jack Lalain in a special show about healthy lifestyles, in which he emphasised the benefits of such gymnastics for people regardless of age, whether they were 5 or 105. During the 1970s and 1980s, water aerobics became widespread in the United States. Later, in the 1990s, it gained popularity in the USSR. Hydroaerobics (aqua aerobics) has been widely used in preschool education institutions for the last 20 years.

2. The history of aromatherapy dates back to ancient times. Aromatic substances were widely used in ancient countries: Egypt, India, China, Greece and Rome. In particular, they were used for disinfecting rooms, skin care, preparing aromatic baths, scenting linen, adding them to food and wine, during the construction of temples, in religious rites, etc. The writings of Hippocrates, Galen, Avicenna, and Theophrastus mention the importance of aromatic oils for the human body and their treatment of certain diseases. Later, F. Hoffmann, M. Gattefos, and D. Valnet studied smells and the mechanisms of their transmission. The modern term "aromatherapy" was introduced by the French chemist and perfumer René-Maurice Gattefos in the 1920s, when he put his hand, which had been burned in the laboratory, into a container with lavender aroma oil and noticed its rapid healing without scarring. It was he who first began to study the antiseptic effect of essential oils on the human body, in particular

lavender, chamomile, lemon, thyme, and later wrote the book Aromatherapy.

French doctor John Valnet continued to work on the effects of aromatic oils on the human body. He also studied the antiseptic effect of essential oils for the treatment of wounds, in the treatment of tuberculosis and other diseases. The development of aromatherapy was promoted by Austrian cosmetologist and biochemist Marguerite Maury, who first combined the use of essential oils with massage and formed a holistic approach to aromatherapy (i.e., the selection of oils for a particular person). As a result, aromatherapy spread to France, Austria, England, and later to the USSR. Russian physician V. Manassein proposed the use of smell therapy (air therapy) to treat certain diseases. Later in the 1930s. The biologist B. Tokin, while researching and describing the bactericidal properties of plants, introduced the term "phytoncides" and in 1942 wrote the book "Bactericides of plant origin (phytoncides)". During these years, the Soviet physician A. Kunzel first began to use aroma baths with pine and valerian oil to treat neuroses. A significant contribution to the development of aromatherapy was made by academician S. Mykolaivskyi, who was one of the first to study the effects of essential oils and substantiated the feasibility of their use in pulmonology and in hazardous industries. Today, aromatherapy is very common; it has been widely used in preschool education institutions for the past 30 years.

The history of phytotherapy dates back to ancient times. As early as the third millennium BC, doctors in Sumer used plants for treatment, which was recorded in a medical treatise. The most common herbs were: mustard, pine, fir, thyme, plum fruits, pears, figs, etc. The Babylonians inherited the Sumerian culture, using licorice root, dope, whitewash, flax seeds, etc. for treatment. They were the first to pay attention to the rules of drying plants (in the shade). Medicinal plants were also used in China, India, and Tibet. The first pharmacologist is considered to be the Chinese emperor Shen-nun (2700 BC). Chinese medicine used more than 1500 plants, including ginseng, Schisandra chinensis, licorice, primrose, skullcap, onion, garlic, asparagus, astragalus, cinnamon, ginger, tangerine peel, dogwood, etc. In ancient Indian medicine, about 800 plants were used, which are mentioned in the Ayurveda

treatise (first century BC). Tibetan medicine also used medicinal plants, which is reflected in the medical treatise "Zhud-shi".

The ancient Greek physician and philosopher Hippocrates (460-370 BC) is considered the founder of scientific medicine, who used 200 medicinal plants in his practice. Ancient Roman physician and pharmacist Claudius Galen published two herbal books describing more than 300 medicinal plants. He was the first to use tinctures and extracts. Herbal medicine has been known since ancient times and was practised by witch doctors, soothsayers and magi. In 1130, Eupraxia, the granddaughter of Vladimir Monomakh, wrote a treatise entitled "Ointments". Later, under Tsar Ivan the Terrible, the Apothecary House was opened to collect medicinal plants throughout Russia. Later, Tsar Peter the Great issued a decree to keep herbalists at court. The use of medicinal herbs continued in the nineteenth and twentieth centuries. Plants with antiseptic and bactericidal effects were especially actively used during the Second World War (garlic, onions, sphagnum moss, calendula, St. John's wort, fir, poplar fluff). Phytotherapy is very common nowadays, and it has been used in preschool education institutions for the last 20-30 years.

The history of vitamin therapy can be closely linked to the emergence of the doctrine of vitamins almost 200 years ago, when people began to study their physiological role and importance in the manifestation of diseases. Although the importance of sprouted grains of wheat, rice, etc. was mentioned as early as in Ancient Egypt, China, and India. The Indian treatise Ayurveda describes the benefits of sprouted sprouts for the body. The Greek physician Hippocrates also recommended sprouted sprouts to his patients. And Slavic peoples actively ate sprouts of wheat, oats, buckwheat in various combinations.

The discovery of certain compounds in food that are necessary for the normal functioning of the body belongs to the scientist and paediatrician M. Lunin (1881). The term "vitamin" was introduced by the Polish scientist Kazimir Funk (1911) while studying beriberi disease. The study of vitamins was also the subject of the works of Chr. Aikman (1897, beriberi), F. Hopkins (1929), W. Murphy, J. Whipple, J. Maino (1934), Al. St Dyördy (1937), E. Doisy, H. Dama (1940). Among Ukrainian researchers, a significant contribution to the study of the role of vitamins in the

human body was made by O. Palladin, R. Chahovets, U. Shamrai, O. Rozanov, P. Podorozhnyi, J. Tomashevskyi and others.

In the twentieth century, vitamins began to be given greater importance and were supplemented with food. In the 1930s, the United States began to vitaminise food, including milk, and other products with vitamin D for the first time. In the 1950s, Finland began to enrich food with vitamin C to prevent stomach and lung cancer, and in Finland and the UK, B vitamins were added to alcoholic beverages to prevent liver cirrhosis. And since 1996, the United States has been adding folic acid to foods to prevent damage to the nervous system of the fetus of pregnant women. Recently, healthy people in the United States have been advised to take a multivitamin supplement on a daily basis. Based on this, medicine is beginning to develop the area of preventive intake of both individual vitamins and their complexes to prevent diseases, which is called vitamin therapy. Vitamin therapy has been used in preschool education institutions for the past 50 years.

3. The history of bibliotherapy dates back to the time when books for children appeared. Fiction is of great importance for the upbringing and development of a child. Reading stories, poems, novels to influence a child was advised by educators of the past: K. Ushynskyi, V. Sukhomlynskyi, E. Tykhieieva. Among the contemporary pedagogues are A. Bohush, N. Havrysh, O. Kononko, and others. The peculiarities of a child's perception of artistic works are studied in the works of L. Vygotsky, S. Rubinstein, O. Zaporozhets, E. Fliorina, and others; as a means of educating and developing children, artistic works have been studied by O. Biletsky, N. Voloshyna, V. Plakhtiy, Y. Yarmysh, and others. In preschool education institutions, reading works has been used since the last century, but bibliotherapy has been actively used as a method of influence for the last 20 years.

The history of fairy tale therapy dates back to ancient times, when folk pedagogy advised telling children folk tales that were passed down from generation to generation. The role of fairy tales has been studied by such psychologists as S. Freud, C. Jung, E. Fromm, and E. Berne. Famous psychologists and educators of the past and present have also paid great attention to fairy tales as a means of child development: O. Zaporozhets, B. Elkonin, K. Ushynskyi, V. Sukhomlynskyi, E.

Vodovozova, E. Tikheeva, L. Slavina, M. Osorina, M. Lisina, V. Propp, T. Zinkevych-Yevstygneeva, etc. As a method of influence, fairy tale therapy has been widely used in work with preschool children since the second half of the twentieth century. Although reading fairy tales in preschool education institutions is not something new, it has been used for therapeutic purposes for the last 20 years.

The history of music therapy dates back to the emergence of music. However, the healing effect of music was first mentioned in the papyri of Ancient Egypt, dating back to 1500 BC. They describe music as a means of healing the body, calming the mind and purifying the soul. In Israel, music was used to treat physical and mental illnesses. The first information about the use of music therapy can be found in Ancient Greece in the works of Pythagoras, Plato, and Aristotle. Music for treatment was also used in ancient Rome, China, and India. The origins of modern music therapy began in the nineteenth century and are associated with the neurologist James L. Corning, who in 1899 conducted the first study of the effect of music on patient treatment.

In the late nineteenth and early twentieth centuries, the first scientific works appeared that revealed the mechanism of music's effect on humans. The works of V. Bekhterev, I. Tarkhanov, and I. Dogel investigated the effect of music on the central nervous system, blood circulation, respiration, and gas exchange. In particular, in 1913, V. Bekhterev founded the Society for the Study of the Therapeutic and Educational Value of Music and Hygiene. The first use of music therapy took place in 1914, as described in the Journal of the American Music Association. In 1918, Margaret Andersen was the first to use music therapy as an academic discipline in the United States at Columbia University. In medicine, music therapy was first used by the French psychiatrist Jean-Etienne Dominique Esquirol. In the 1930s, German doctors began to use music therapy to treat stomach ulcers, Swiss doctors to treat mild forms of tuberculosis, and Austrian obstetricians to relieve pain during childbirth. Music therapy also began to be used in dentistry and surgery for pain relief. This led to its spread and the fact that in the second half of the twentieth century, many music and psychotherapy centres were established in many European countries (Sweden, Switzerland, Austria, Germany) and the USA, where music

therapy was actively used, which contributed to its development as a separate industry. Today, music therapy is widely advised by such pedagogues as S. Stevenson, S. Mamulov, L. Ignatieva, M. Proselkova, Y. Shevchenko, G. Podkopaeva, and others to be used in the work with preschool children. Music therapy as a method of psychotherapy has been used in preschool education institutions for the last 20 years.

The history of art therapy is connected with the ideas of psychoanalysis by S. Freud and C. Jung, who argued that artistic creativity expresses the unconscious. However, unlike S. Freud, it was C. Jung who suggested that patients express their dreams and fantasies in drawings and then studied them for the purpose of psychoanalysis. The term "art therapy" was introduced in 1938 by the artist Adrian Hill while working with tuberculosis patients in a sanatorium. Later, art therapy was applied to children after their stay in German concentration camps. In the United States, in 1966, Margaret Naumburg was one of the first to use art therapy with children with behavioural problems, and she later developed several art therapy training programmes. In 1969, the American Art Therapy Association was founded in America. Gradually, art therapy became more widespread during the twentieth century. In preschool education institutions, it has been widely used as a method of psychotherapy for the last 30 years.

The history of kinesiotherapy dates back to ancient times, when people intuitively massaged and actively worked out the sore part of the body. The first recorded results of kinesiotherapy in the form of breathing techniques and exercises date back to the third millennium BC in Ancient China, where there was a school for training in therapeutic gymnastics and massage. References to the use of physical education, gymnastics, and massage for various diseases can also be found in the Chinese book Kung Fu (2698 BC), in Egyptian images on the walls of pyramids and sarcophagi, and in the Indian book Ayurveda (1800 BC). In ancient India, the doctrine of yoga included more than 900 special breathing exercises for the prevention and treatment of various diseases. Ancient Greece was famous for the founders of medical gymnastics, including Hippocrates, Celsus, Aspelius, Herodotus and others, who advised physical exercises, massage, hydrotherapy and proper

nutrition for the prevention and treatment of diseases of the limbs. In Ancient Rome, the development of therapeutic gymnastics continued and reached a high level. For the first time, a book on therapeutic gymnastics by C. Galen, The Art of Restoring Health, was published. Later, books on therapeutic gymnastics were published by Avicenna: "The Canon of Medical Science" and "The Book of Healing".

During the Renaissance, attention to therapeutic gymnastics increased significantly, and in 1573 the Italian physician Jerome Mercurias published the first textbook on medical gymnastics. In the late 1770s, the French military doctor and physiotherapist C. Tissot, author of the famous aphorism "Movement can replace many medicines, but no medicine can replace movement", introduced therapeutic gymnastics for the treatment of orthopaedic and surgical patients, and in 1782 wrote the work "Medical and surgical gymnastics" ("Gymnastique médicinale et chirurgicale"). Later, about a hundred years later, the German scientist and physician F. Hoffmann developed a system of treatment based on exercise and proper nutrition.

In the nineteenth century, the development of therapeutic gymnastics was continued by well-known scientists and doctors M. Pirogov, H. Hübbenet, V. Stange, P. Lesgaft, M. Barsov, F. Grebner, and others. M. Pirogov recommended using physical exercises to treat the wounded, and his student Professor H. Gubbenet in 1854 made a report "On the importance of gymnastics in the life of man and nations". V. Stange, who was the founder of the functional breath-holding test, headed the Department of Physical Therapy and Non-drug Therapy in Petrograd. M. Barsov in Moscow founded a massage and gymnastics institute and started massage courses, and F. Grebner in Odesa created an institute of mechanotherapy for medical gymnastics. P. Lesgaft, having studied for two years the organisation of gymnastics classes in Europe and the practice of training gymnastics teachers, opened two-year gymnastics training courses.

In the twentieth century, the development of therapeutic gymnastics was associated with such names as V. Kramarenko (1911, work "Manual on Massage and Therapeutic Gymnastics"), M. Sitenko (1921, opening of the first children's orthopaedic dispensary in Kharkiv), B. Shymshelevych (1929, instead of the concepts of "medical gymnastics", "kinesitherapy", "ergotherapy", etc. he introduced the

concept of "therapeutic physical culture", although it is narrower than kinesitherapy).

Kinesitherapy was actively developed during the Second World War and the post-war period. In recent years, kinesiotherapy has been used to develop author's methods: V. Dikul's method for the treatment of spinal diseases; S. Bubnovsky's method for the treatment of joint and spinal diseases; A. Sitel's method for the treatment of joint and spinal diseases; O. Shishonin's method for the treatment of the cervical spine. Today, kinesiotherapy is actively practiced in medical rehabilitation in hospitals, physical therapy clinics, polyclinics and other healthcare facilities. In preschool education institutions, kinesitherapy has been used in a simplified form for the last 20-30 years.

The history of reflexology dates back to ancient China, where acupuncture and cauterisation were known in 5,000 BC. Chinese doctors accumulated experience and passed it on from generation to generation. The first medical treatise on acupuncture, which outlined the indications and contraindications for acupuncture, the rules for its implementation and the topography of 295 points, was the book Huang-di nei jing ("Treatise on the Internal, or Nature of Life"), dated around 221 BC. Later, Huang Fumi wrote the book Jia-yi-jing, in which he described 649 acupuncture points and first used the term "zhen-jiu" (zhen – needle prick, jiu – cauterisation). In 1026, the "Atlas of Points" with 600 acupuncture and cauterisation points was published and a bronze statuette of a man with the points was cast. A significant step for the development of reflexology was the establishment of the first medical schools and a higher medical school in China in 1076, which began training acupuncture and cauterisation specialists.

Reflexology appeared in Europe in the thirteenth century thanks to missionaries, merchants, and travellers. However, the first book was published much later - in 1671. Significant interest in this method of therapy increased in the nineteenth century, when French authors published 142 works in this field. For example, in 1816, L. Berlioz wrote the book Notes on Chronic Diseases, Bloodletting and Acupuncture, and in 1826, J. Cloquet published a book on acupuncture in Paris.

The author of modern reflexology is considered to be the American scientist William Fitzgerald, who in 1913 outlined a scheme of interconnections between

different parts of the body, identifying ten main lines that run through the entire human body. In the mid-1950s, Soviet scientists – Prof. I. Rusetsky, Prof. V. Vogralik, E. Tikochinska, M. Usova, and M. Osipova – were sent to China for two years to study this method and further apply it in medical practice. This made it possible to train reflexology specialists at the Department of Neurology (Kyiv) since 1978. Reflexology in a simplified form has been used in preschool education institutions for the last 10-15 years.

The history of game therapy is associated with Sigmund Freud, who in 1913 first used the game in the practice of child psychotherapy as an additional method. However, he did not consider the play as a therapy. In 1932, it was M. Klein who drew attention to play as a therapeutic tool and began to use it in children's psychotherapy. She invented games for children and passively observed their progress, even allowing children to change the rules. In 1946, A. Freud emphasised that in a game, one should take an active position and lead the process, rather than watch from a distance. In her work with children, she used small dolls as family members and insisted on working with parents to correct their parenting style. In accordance with these two approaches, two models of play therapy were developed: directive (controlling the child's play) – forming socially acceptable behaviour, desirable skills of existence in society through identification with different characters in the game and non-directive (not interfering with the game process or free play) – enabling the child to express his or her feelings and emotions, even hidden ones – aggression, fear, resentment, etc.; to solve his or her internal conflicts or problems by relieving tension; creating an atmosphere that reflects all feelings and in which the child can take responsibility for his or her actions. The means of non-directive play therapy are: structured – through which the child reveals his or her own needs (dolls, soft toys are used); unstructured – used for emotional release (games with sand, water, clay, etc. are used); toys that help to establish contact or identify problems in communication (guns, cars, planes, telephones, etc. are used).

The works of M. Lowenfeld, L. Vygotsky, B. Elkonin, S. Rubinstein and others are devoted to the game as a leading activity, and game therapy as a method of psychotherapy is paid attention to in the researches of M. Klein, A. Freud, G. Hag-

Helmuth, J. Kessler, D. Levy, F. Allen, D. Tufty, C. Rogers, H. Ginott, G. Landreth, W. Exline, K. Mustakas, etc. In the late 80s and early 90s of the twentieth century. R. Dmytrychenko was one of the first to actively use the technology of game therapy in the work with children and adults and is the developer of the author's methodology "Psychodrama on the Table". Play therapy as a method of psychotherapy has been used in preschool education institutions for the last 20 years.

The history of sand therapy dates back to 1929, when the English child psychotherapist M. Loewenfeld began using a tray of sand and toys in her work with children. Based on this, she developed the "Lowenfeld World Technique" and first presented it in 1931, and in 1937, at a conference where M. Lowenfeld spoke, C. Jung became interested in her ideas and developed the principle of "sand therapy". In the 1950s, M. Loewenfeld's theories and methods served to develop sand therapy in its modern form by the Swiss physician and psychotherapist D. Kallff, a student of C. Jung. She developed the theoretical principles of sand therapy, changed some of the conditions of working with sand (the size of the sandbox, raised the sandbox from the floor to the table, added a jug of water). D. Kallff introduced the term "sand therapy" (Sandplay) and developed it in the form in which it is used today: a box with sand (or two boxes: one with dry sand, the other with wet sand), painted blue inside – the colour of the sky, water bodies, shelves with models made of different materials (glass, plastic, wood, iron, etc.) and miniature toys, natural material, a jug of water for playing with sand. Sand therapy as a method of psychotherapy has been used in preschool education institutions for the last 20 years.

Lecture 4-5: Methods of conducting health technologies with preschool children

Plan

1. Methods of conducting innovative health technologies; fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics.

2. Methods of conducting preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy.

3. Methods of conducting therapeutic health technologies: bibliotherapy, laughter therapy, music therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy.

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1. Gymnastic balls help to implement a number of general developmental, preventive and health-improving tasks in the physical education of preschoolers, and exercises on them have a positive effect on the physical, mental state and physiological functions of the child's body. Movement actions with balls strengthen the back and abdominal muscles, but most importantly, they develop the skills of correct posture. This activity helps to improve balance and motor control, as well as strengthen and relax muscle groups and can be used to train the cardiovascular and respiratory systems.

Fitball gymnastics can also be effectively used in working with children with health problems: impaired coordination of movements, overweight, respiratory diseases, muscle weakness, and poor posture. Such work requires the pedagogue to take into account the individual characteristics of children. Exercises on fitball should be performed in comfortable clothes and socks for 20-25 minutes for children aged 3-4 years, 30-35 minutes – 5-6 years. In the sixth year of life, musical accompaniment can be introduced, as children of this age can already relate their actions to music.

Fitball gymnastics can be used during morning gymnastics, walks, independent

games of children, entertainment, individual and physical education classes, where work on fitballs should not exceed 40% of the time of the whole class.

Breathing exercises (or several of its exercises – 2-4) can be performed during morning and after daytime sleep exercises, during physical education and physical education classes, other classes, walks, before and after bedtime. Breathing exercises are recommended for children of early and preschool age, with a duration ranging from 3-6 minutes to 10-15 minutes, a slow (for younger children) or medium (for older pre-schoolers) pace, and a number of repetitions of each exercise: 4-5 times for younger children and 6-8 times for older children. Breathing exercises according to K. Buteyko can be started from the age of 4. Some exercises can be performed during morning and afternoon exercises, at classes, before and after sleep, or as a separate complex, for example, during a walk. Breathing exercises according to B. Tolkachev can be performed as a complex during a walk or you can use its particular exercises during morning exercises and exercises after a daytime nap, at classes, before and after sleep. Breathing exercises by O. Strelnikova can be performed with children from 3-4 years old both in the morning, during morning exercises, and in the evening.

In case of bronchial asthma, the sounds are made strongly, energetically, loudly, and in case of obstructive bronchitis - softly, quietly, calmly. When performing gymnastic exercises, it is important to inhale and exhale correctly: inhale through the nose for 1-2 seconds, then pause for 1 second, then exhale through the mouth for 2-4 seconds, and again pause for 4-6 seconds. Classes begin with a "cleansing exhalation": lips are folded into a tube and spoken through: "pff"; this exhalation is also used between sound pairs (before and after). In addition to the above exercise, a compulsory exercise is the "closed moan" – saying "mmm" while sitting, hands on knees, leaning forward.

You can use sound gymnastics as a separate form of work lasting from 5-6 minutes to 25-30 minutes, for example, during a walk, before and after sleep, or perform some of its exercises during morning exercises, physical minutes, classes, etc.

The duration of immune gymnastics is from 2-3 minutes to 5-6 minutes. The immune gymnastics complex should be performed after morning gymnastics, before

games and classes, before and after naps, during a walk, and its certain exercises can be used during morning gymnastics and after naps gymnastics, physical minutes.

The exercises are performed slowly, 3 to 5 times with each hand, for several minutes 2-3 times a day. Such exercises can be used in modelling, drawing, construction, and other classes where it is necessary to relax the small muscles of the child's hands; it can also be performed after physical education classes, during a walk, before and after sleep.

The duration of psycho-gymnastics should not exceed 15-20 minutes. Each class should include at least 2-3 exercises with facial expressions, pantomime for emotions and emotional contact, which help children understand others, realise their own and other people's emotions, express and experience them correctly. Psychogymnastics can be used not only as a form of work with children, but also as a separate exercise in the classroom, during physical minutes, during a walk, before and after sleep, etc.

The duration and number of repetitions of hydroaerobics exercises depends on the age of the children, but it is worth remembering that in the water environment the workload increases slightly and the child does not notice fatigue. Hydroaerobics exercises can be performed daily according to the age of children, using them during swimming classes, during a walk in the summer.

2. Aromatherapy can be used in a variety of ways:

- Massage, self-massage;
- Baths (creams, shampoos, soaps);
- Aromatisation of the premises;
- Aromacoolon;
- Inhalation.

Massage. Essential oils are actively used during massage. However, it is necessary to take into account contraindications for massage. A few drops of specially selected essential oils are added to the massage cream. The procedure lasts 15-20 minutes and is done a couple of times a week. Helps relieve muscle pain. For example, sweet almond oil is an almost universal product that is easily absorbed into the skin. There are no complications after using this oil, so it is often used even in infant massage. Walnut oil coordinates an unbalanced nervous system. Sesame oil is

suitable for removing stretch marks, while apricot and peach oils improve tissue repair.

Baths (creams, shampoos, soaps). Prepare a warm (but not hot) bath, in particular a gentle one, then add 6-8 drops of the same oil or mixture, having previously dissolved it, for example, in liquid soap or milk, etc. Mix with water until an aromatic film forms on the surface of the water. Do not add the oil to running water as it will evaporate. Immerse your feet (or body) in the bath for 10-15 minutes. In this case, not only can you inhale the aromatic vapour, but some of the oil will penetrate the skin.

You can add essential oil in small amounts to creams and other products. However, it should be remembered that essential oils do not dissolve in water, so it is necessary to use an emulsifier – cream, soda, liquid honey, baby shampoo, sea salt, liquid soap, bath foam).

Aromatisation of the premises. Aromatisation is very simple: water is poured into a spray bottle and a few drops of essential oils are added. Then the product is distributed around the room. Special aromatherapy devices can also be used: aroma lamps, aroma candles and aroma sticks, which are used to disinfect and aromatise the air in the room. The positive effect will spread to everyone in the room.

Aromacoolon with the addition of essential oils is an excellent prevention of various viral infections. This method of therapy is recommended for children during the epidemic, of course, if the child is not allergic to the essential oil used. Wear it when the child will not be disturbed: at all classes, except for physical education, during games (didactic, role-playing), while doing puzzles, drawing, looking at books, etc.

Inhalation. Inhalation is one of the most affordable methods of aromatherapy. It is the fastest of all methods because the smell acts directly on the brain, which controls emotions and memory. There are several methods of inhalation with essential oils: hot and dry – for the treatment of various diseases, including respiratory diseases.

Hot inhalation. Pour hot water into a bowl and add 10 drops of oil. Lean over the bowl, cover your head with a towel and breathe the steam until the smell is completely gone. This process can be repeated three times a day.

Dry inhalation. Put 10 drops of essential oil on a handkerchief or cloth, hold it to your nose and inhale. To treat a runny nose while sleeping, place a handkerchief on your pillow. Eucalyptus oil is especially effective for a runny nose.

By combining several essential oils, you can create unique aromatic compositions that will have a positive effect on your well-being and emotional state. Such products help to lift your mood, get rid of depression and maintain peace of mind. To scent your bed linen and clothes, you can place a sponge in the wardrobe with a few drops of essential oil on it.

Aromatherapy can be carried out during washing or foot washing (a few drops of oil in water, mixed with liquid soap, milk or honey), massage (a few drops of oil per 5-10 ml of base oil), inhalation (a few drops of oil), as well as inhaling the vapours with an aroma lamp (a few drops of oil for 15-30 minutes). In addition to aromatherapy oils, you can use the inhalation of flowers and herbs, such as lily of the valley, chamomile, sage, thyme, mint, lemon balm, etc. to improve your physical health and develop your sense of smell. Aromatherapy should be used before or after classes, work activities, and before bedtime to relieve fatigue, relax the body, improve the health and well-being of children.

Devices for the use of aromatherapy:

- Diffuser (for spraying oil in the air);
- Inhaler;
- Aroma lamp;
- Aroma candles, aroma sticks;
- Aromacoolon.

A distinctive feature of essential oils is their high penetrating ability, which is why they can be used in several ways, but certain nuances must be taken into account:

- first, you need to decide on the aroma of the oil;

- before starting to use essential oils, a small test with minimal dosages is mandatory. If you notice a positive effect, you can gradually increase the level of oil concentration, but do not exceed the permissible limit;
- it is not recommended to use the same essential oil for more than 10 days in a row;
- -do not apply pure essential oil to the skin, dilute with a base oil (sunflower oil, olive oil), except for lavender, tea tree oil.

Contraindications. Despite the fact that scientists have thoroughly studied the composition of essential oils and their effect, it is necessary to minimise their use in the following cases

- patients with epilepsy;
- if there is a tendency to allergies;
- in case of seasonal allergic rhinitis;
- during therapy with homeopathic medicines;
- in case of coronary heart disease and thrombophlebitis, kidney diseases.

Natural essential oils should be used with extreme caution in the care of delicate and sensitive skin, including in case of high blood pressure. There is a certain category of essential oils that are contraindicated for use in children under 6 years of age, otherwise they can cause increased nervous excitability and provoke insomnia:

- for babies under two weeks of age, almond, chamomile, rose, lavender, orange, lemon, cinnamon oils are contraindicated;
- up to 1 year - peppermint oil;
- up to 2.5 years - eucalyptus oil;
- up to six years - rosemary, thyme, geranium oil.

Rules for the use of aromatherapy in preschool education institutions:

- Absence of allergies. If there is someone with a similar disease among the kids, you should find out if they are intolerant to the scent you want to use.
- Conduct a preliminary survey of parents about the use of aromatherapy.
- If there are children with asthma in the group, this method of preventing ARVD should be excluded. The only exception may be days when the child is absent.

- Essential oils should be sprayed using an aroma lamp and never on the skin or clothing.
- The concentration of essential oils should be minimal.
- Ventilate and refresh the air with aromas very often.
- Do not allow oil and vapours to get into the baby's eyes. Do not apply it in pure form to the skin and do not use it internally.
- For inhalation or bathing, use diluted oil with a base.
- Do not use the oil without first testing it.
- The aroma lamp should be placed somewhere in the centre of the room, but out of the reach of children.
- In a group, you can drip essential oil directly onto the radiator. In winter, when the radiators are hot, they release the miraculous aroma more intensely. It is also effective to wash the floor in the bathroom and toilet with water with the addition of essential oil, having previously dissolved it in alcohol.
- Follow and do not exceed the duration of aromatherapy - the procedure starts at one minute and eventually extends to 30 minutes. For children under one year, 30 seconds is enough.

Basic principles of aromatherapy:

- *An integrated approach to the child.* This method involves influencing not only the causes and pathological changes in diseases, but, above all, stimulating and increasing the body's defences.

- *The principle of individuality*. It should always be remembered that the biologically active substances of aromas act on a person through his or her psyche, sense of smell, and soul, so it is important to use only aromas that are pleasant to the patient in healing.

- *The principle of versatile action.* The aroma of plants is a complex of various biologically active substances, so the same scents can be used to treat several diseases. For example, lavender oil is one of the best antiseptics, but it also has the ability to improve mood, eliminate fatigue, depression, and headaches.

- *The principle of dosage*. Practical experience shows that smaller doses can have a much greater effect, especially if the problem is emotional or psychological.

- *The principle of combining aromatherapy and other therapies.* Aromatherapy can be used both independently and in combination with other non-traditional (psychotherapy, reflexology, physiotherapy, massage) and medical treatments.

The most common forms of using medicinal plants are herbal teas, decoctions, phytococktails, and inhalation of phytobags. Tea is prepared as follows: place the plant in a cup and pour just boiled water, cover, let it brew for 15 minutes and drink tea in 3-4 doses throughout the day. A decoction is prepared as follows: put the plant in a saucepan, cover with cold water, cover and boil. Turn off and let the decoction brew for 15-20 minutes. Take a third of a glass 3-4 times a day. Phytococktails are prepared as follows: mix several plants and prepare either as a tea or a decoction. Fill bags with medicinal plants: lavender, mint, lemon balm, etc. and use them to calm children.

Herbs that should be used intermittently include St. John's wort, hop cones, linden, plantain leaves, tansy (with caution), yarrow, goldenrod, pine and spruce branches.

The following plants are everyday medicinal herbs: willow-herb, thyme, chamomile, lemon balm, mint, calendula, blueberry leaves; rose hips, barberry, sea buckthorn; currant, raspberry, cherry, blackberry, strawberry leaves; raspberries, viburnum, chokeberry, etc. Also, some medicinal plants of daily use and herbs and spices can be added to children's food: nettle (young stems with leaves in early spring), dandelion (leaves in early spring), rhubarb (leaves), tarragon (shoots), currant (buds and young leaves), rosehip (young leaves), sorrel spinach, dill, parsley, cilantro, arugula, basil, asparagus, garlic, onion (green feathers), cumin, celery, fennel, parsnip, marjoram, sage, watercress, mustard, coriander, ground white pepper. Phytotherapy also involves the use of herbal bags with medicinal plants (put on children's pillows before bedtime or inhale in their free time).

With preschool children, vitamin therapy can be used daily in the form of drinking tea with lemon, rosehip broth, garlic, onion, pumpkin, carrot, beetroot, natural juices (apple, carrot, grape, pomegranate etc.), as well as, as pedagogues advise, extracts of eleutherococcus and rhodiola, Chinese lemongrass berries, sprouted wheat, oats, rye, eggshells, and a vitamin complex.

C-vitaminisation of the third course is carried out once a day, as vitamin C is destroyed during the heat treatment process. Vitamin therapy is used during meals: breakfast, lunch, afternoon snack, dinner.

3. Reading books is indicated for hyperactive and hypoactive children: for hyperactive children, reading literature that calms them down, and for hypoactive children, reading books that stimulate emotional experiences. Reading fairy tales and stories before bedtime helps children fall asleep quickly and sleep soundly, and after exercising on a mat with calm music helps them recover and calm down. You can use bibliotherapy every day, the main thing is that the books should be understandable for children. When reading a story, poem or fairy tale, points that are not clear to the child should be explained, and after reading them, it is necessary to have a conversation about the content. This type of therapy can be used in the classroom and in free time, during walks, and before bedtime.

The following methods of music therapy are distinguished: active (expressive) - when children express themselves; passive (receptive) - when children only listen to music. It also covers the following areas: vocal therapy (singing), movement (dancing, musical and rhythmic games), and music-making on musical instruments. The use of singing in subgroups with simultaneous movements has a positive effect on the nervous system of children, and musical and rhythmic games throughout the room – on their motor activity. Some pedagogues (S. Stevenson, S. Mamulov, L. Ignatieva) point to the positive impact of musical instruments: playing the clarinet helps to improve blood circulation, normalises the cardiovascular system; violin and piano - calms and relaxes. M. Proselkova, Y. Shevchenko, and G. Podkopaeva consider the use of music therapy for neuropsychiatric disorders in preschoolers to be reasonable and promising.

Music therapy can be carried out daily with an individual child or with a group, with the most effective age being 5-7 years. For this purpose, it is necessary to have a separate room where musical instruments from different countries of the world will be placed, adapted to the child's age, so that he or she can play them comfortably. The instruments should be colourful, of good quality, and have precise tuning. Different types of music are suitable for listening to (church bells, opera, classical music, folk

music (lullabies), rock music (with caution, etc.), but the most common is the music of W. Mozart. After listening to the music, children discuss their impressions, thoughts, memories, fantasies, associations.

No more than three pieces of music or excerpts of music are listened to at one music therapy session. Each piece should be no more than 10 minutes long: the first piece should be calm, relaxing music, the second should be dynamic, dramatic, bright music (main music), and the third should be for stress relief, calming (calm or energetic optimistic music). The total time for listening to music is from 10-15 minutes to 30 minutes, for therapeutic purposes – for children aged 4-5 years up to 5 minutes, for children aged 6-7 years up to 10 minutes, for normalisation of the mental state 10-15 minutes daily is enough. Classes are held after a meal, 1,5-2 hours later, in a special room without foreign objects, toys, with plenty of pillows; the volume of music should not be too loud, but such that you can fall asleep.

Music therapy can be used during morning gymnastics, physical education classes, outdoor games, before going to bed, during a walk, etc. The use of music during morning exercises and physical education classes will not only help children to perform exercises (cheerful, fast or slow music), but also to relax after they have done them (calm, even-sounding music).

Art therapy is conducted as a separate form of work, or as a component of another form of work; it can be both individual and group. There are no time limits, the main thing is that the child should draw a picture, construct (for example, origami) or make a sculpture. Art therapy can be applied in the form of drawing pictures of various subjects, both individually and collectively. For example, drawing an animal that does not exist (see Appendix E); several children drawing a landscape on a drawing paper using different techniques: a brush, finger, palm, piece of foil (see Appendix K); drawing something that embarrasses; drawing their fear, i.e. what the child is afraid of; drawing something that scared them, etc.

In addition to drawings, you can use sculptures made of different materials or paper construction, for example, making origami - various paper figures. Recently, origami has been gaining popularity, and it helps to work with children with autism or who are in a state of fear, anxiety, depression, to increase self-confidence, improve

their emotional state. Art therapy can be used during walks, classes, and in free time.

In preschool education institutions, kinesiotherapy is represented by outdoor games as a type of active movement, physical exercises of various purposes: for the musculoskeletal system, to improve speech, to strengthen the general tone of the body, massage and self-massage, the duration of which should correspond to the age of the child. For children, in addition to outdoor games, massage and exercise, dancing should be used to improve their health, strengthen their posture and prevent flat feet, and an individual approach should be used. Dancing also has a positive effect on the mental well-being of children, improving their mood. Kinesiotherapy can be used during morning exercises, physical minutes, walks, exercises after a day's sleep, physical education classes and physical education therapy classes.

There are many different methods of reflexology: acupuncture, cauterisation (heating or thermotherapy), acupressure, auriculotherapy, electropuncture (microcurrent reflexology), vacuum (can therapy), magnetopuncture, laser, centimetre-wave, ultrasound, facial, apireflexology. However, the following therapies can be used with preschool children: acupressure, auriculotherapy, can therapy, facial reflexology.

Acupressure is pressing on points with the fingertips. For example, if a person has a runny nose, we press on the wings of the nose with the phalanges of the index fingers (nasotherapy), as well as on the points just above the beginning of the eyebrows. Auriculotherapy is an effect of acupressure on the active points of the auricle, which has more than 200 active points. Normally, the points are painless; in acute phase diseases, pain is felt when they are pressed, and in the chronic form of the disease, tuberosity, peeling, and pallor appear. For example, massage (self-massage) of the child's ears. Vacuum or can therapy - the use of special cans by creating a vacuum. For example, driving (applying) jars on the child's back, abdomen, chest. Facial reflexology involves exposure to biologically active points on the face. Its essence is to normalise microcirculation in soft tissues. For example, massage (self-massage) of the child's face. You can also use the following types of reflexology techniques: corporal (whole body), cranial (scalp), su-jok (palms and hands), pedotherapy (soles of feet).

There are many biologically active points on the foot that can be influenced by kinesio-reflexology techniques. One of them is walking barefoot on a path with a gradually increasing hardness: grass, sand, sea pebbles, pebbles, cones, stones, stumps. Such walking not only affects the points, but also helps to harden the body. After exercise, to relieve fatigue and muscle tension, preschool children should use finger massage and self-massage of active points on the fingers, feet, face, and hands. It would be best to teach children to perform a few simple massage movements after exercising before and after naps, at the end of the day. The duration of a treatment session is from 5 to 20 minutes. Reflexology exercises can be used during morning gymnastics, physical exercises, walks, exercises after a nap, classes and in free time.

There are individual and group game therapy, the latter is recommended for children with the following disorders (according to H. Ginott): non-contact children; immature children (from overprotective parents); children with fears (fear of darkness, loud sounds, dirt, etc.); "too obedient" children; children with bad habits (finger sucking, nail biting, tantrums, etc.); children with behavioural disorders (aggressive, violent). Different types of games can be used for play therapy with children in preschool education institutions: role-playing, outdoor, didactic, and theatrical. Especially useful are games with water and sand, which are not only fun, but also contribute to the physical and mental development of children, raise their mood, and improve their well-being. The duration and frequency of play therapy depends on the age of the children, the goal, and the depth of the problem. Play therapy can be used during walks, classes and in free time).

You can play with sand both on the playground (sandbox) and in the group room (the size of the box is optional, but it is not allowed 70 cm by 50 cm, 7 to 10-15 cm high with calcined sand, the bottom and sides of which are painted blue). There are two options for indoor sand therapy: illuminated boxes (light sandbox) and unilluminated boxes (interactive sandbox).

Illuminated boxes use a thin layer of sand, the bottom of which is illuminated; when you draw on the sand, the drawing glows. Non-lighted boxes have a thick layer of sand where children can build different compositions with figures, houses, etc. and play role-playing games: family, farm, construction, etc. using different figures. It is

advisable to play out different scenes from the life of animals of different habitats: desert, safari, tropics, etc. using figures of animals, birds, trees, bushes. The boxes are arranged so that they can be accessed from different sides; next to the boxes, various figures and objects for games are placed on a shelf. You can also use wet, kinetic, multi-coloured sand.

The duration of games with sand is unlimited. During such games, children reflect their inner world, changes in their psyche, their conflicts, fears, worries, family problems, etc. You can use sand therapy during the day in your free time, during a walk.

Lecture 6-7: The influence of health technologies on the body of preschool children

Plan

1. Influence of health technologies on the respiratory system of children.
2. Influence of health technologies on the cardiovascular system of children.
3. Influence of health technologies on the immune system of children.
4. Influence of health technologies on the nervous system of children.
5. Influence of health technologies on the digestive system of children.
6. Influence of health technologies on the excretory system of children.
7. Influence of health technologies on children's musculoskeletal system.

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1. Breathing is a necessary physiological process of constant exchange of gases between the body and the environment. As a result of breathing, oxygen enters the body, which is used by every cell in the body in oxidation reactions, which is the

basis of metabolism and energy. These reactions produce carbon dioxide, the excess of which must be constantly removed from the body.

The human respiratory system consists of the following organs:

- the airways (nose, nasopharynx, larynx, trachea, bronchi of different diameters);

- lungs, which consist of the smallest airways – bronchioles, air bubbles – alveoli, braided by capillaries;

- musculoskeletal system of the chest, which provides respiratory movements (ribs, intercostal muscles, diaphragm).

The respiratory system in children has a number of features.

By the age of six or seven, the formation of lung and airway tissue is mostly complete. At this age, abdominal breathing gradually changes, and between four and six years of age, thoracic breathing gradually begins to prevail. The structure of the preschooler's lung tissue is not yet fully developed; the nasal passages, trachea and bronchi are relatively narrow, which makes it difficult for air to enter the lungs; the ribs are significantly lowered, the diaphragm is placed high, and the lung capacity is relatively low. All this causes shallow breathing, which is fully compensated for by its frequency, which decreases with age.

The respiratory rate fluctuates due to the easy excitability of the respiratory centre not only within the same age group of children, but also in the same child during the day. The respiratory frequency changes under the influence of various factors: mental arousal, exercise, increased body temperature or environment.

With age, the resting breathing frequency decreases and approaches that of adults. Slow and deep breathing of children in preschool age contributes to the intensive exchange of gases between blood and air contained in the lungs.

The vital capacity of the lungs (according to V. Molchanov) in children aged three to four years is 400-500 ml, in four to six years – 800-1000 ml, in adults – 3000-5000 ml. It is practically impossible to determine the vital capacity of the lungs in children under three years of age.

A child passes much more blood through the lungs than an adult. This allows the child's body to meet the need for oxygen due to intensive metabolism. The increased

need for oxygen during physical activity is met by the frequency and, to a lesser extent, by changes in the depth of breathing. Under the influence of various physical exercises, chest excursion increases, respiratory muscles strengthen, and gas exchange in the lungs increases.

From the age of three, a child learns to breathe through the nose. This prevents infection carriers and dust from entering his or her body and lingering on the mucous membrane of the nasal cavity. Thus, cold air, penetrating through the nasal passages, warms up, and dry air moisturises. This prevents cooling of the airways and eliminates the irritating effect of dry air on them. Considering the peculiarities of the respiratory system of young children and pre-schoolers, it is necessary to create conditions for them to stay outdoors during walks and daytime sleep. Physical exercises that contribute to the development and improvement of the respiratory system are especially useful. These include walking, running, skiing, skating, swimming, etc.

Health technologies that help strengthen the respiratory system:

- Breathing exercises
- Sound gymnastics
- Immune gymnastics
- Hydro aerobics
- Aromatherapy:

* to facilitate breathing, use essential oils of lavender and eucalyptus or vanilla, lime or cinnamon;

* For a runny nose: fir essential oil, for coughing: eucalyptus and cedarwood;

* for the treatment of colds: eucalyptus, lemon, pine, cedar or sage oil;

* lemon, cypress, pine, fir, eucalyptus, cedar oils have antiseptic effect on the respiratory system;

* rosemary oil has anti-inflammatory effect in case of respiratory diseases;

* fir oil has antiseptic, anti-inflammatory and expectorant effect in case of upper respiratory tract diseases;

* juniper oil has an expectorant effect in acute and chronic respiratory diseases;

* eucalyptus oil is used for respiratory tract diseases (bronchitis, tonsillitis);

* sandalwood oil is used for infectious diseases of the respiratory system;

* lavender, tea tree, fir, thyme oils have antitussive, expectorant, analgesic effect.

- Phytotherapy
- Vitamin therapy
- Music therapy
- Kinesitherapy
- Reflexology
- Colour therapy

2. Between birth and six years of age, the cardiovascular system is restructured to a more optimal level of functioning, which increases children's ability to move. The weight of the heart increases from 20 g in a newborn child to 92 g at the age of six, which increases the strength of heart contractions and improves its performance. The blood vessels in a child are wider than in adults, and blood flows through them much faster. There is also relatively more blood (about 50 g per 1 kg of adult weight, and 60-80 g in a pre-schooler). However, the path through the blood vessels is much shorter and the blood circulation speed is higher.

The heart rate in the first months of life is 120-140 times per minute, at the end of the first year of life – 100-130, in children aged two to four years – 90-120, and five to six years – 80-100 times per minute at rest. Moreover, girls have a heart rate 5-7 beats higher than boys. Blood pressure rises slightly with age: in the first year of life it is 80-85/55-60 ml Hg, in three to six years it ranges from 80-100/50-70 ml Hg.

Blood performs the following functions: respiratory (carrying gases), transport (carrying water, nutrients, decay products), protective (destroying pathogens, removing toxins, preventing blood loss), regulating (carrying hormones and enzymes), thermoregulating. With age, the amount of blood per 1 kg of body weight in the body of children decreases. In children under 1 year, the amount of blood relative to the total body weight is up to 14.7%, at the age of 1-6 years – 10.9%, and only at the age of 6-11 years – it is set at the level of adults – 7%.

Gradually, the heart's performance improves, its adaptability to physical activity increases, and the recovery period after exercise is shortened. The heart in children is

very quickly excited. On the one hand, it has the ability to quickly adapt to physical activity and restore its performance, and on the other hand, its functioning is unstable. Under the influence of many factors (physical activity, increase or decrease in temperature, emotional excitement, etc.), the heart rate is disturbed (sharp fluctuation of the pulse, change in blood pressure).

Prolonged physical and mental stress can negatively affect the activity of the heart, lead to its disruption. If the physical load increases faster than the cardiovascular system has time to adapt to it, and such significant loads are often repeated, various pathological phenomena may occur in the heart muscle and blood vessels. Therefore, it is necessary to dose physical activity in accordance with the age characteristics and health status of the child. Strengthening the training of the child's heart through systematic physical education, conducting mobile games, especially in the fresh air, and creating an optimal movement regime in a preschool institution is of exceptional importance.

Health technologies that help strengthen the cardiovascular system:

- Breathing exercises
- Sound gymnastics
- Immune gymnastics
- Hydro aerobics
- Aromatherapy:

* black pepper essential oil helps with headaches by dilating blood vessels, thereby relieving tension and allowing blood to flow freely;

* lavender oil, ylang-ylang oil helps to reduce high blood pressure, eliminates headaches and migraines caused by vasospasm;

* lemon oil tones the walls of blood vessels in case of varicose veins;

* rosemary oil is effective in vegetative-vascular dystonia, eliminates headache, dizziness, increases low blood pressure;

* mandarin and orange oil optimises blood circulation, eliminates inflammation and bleeding of the gums

* fir oil raises blood pressure in case of hypotension, reduces dependence on atmospheric pressure changes (meteorological dependence);

* juniper oil eliminates dizziness and weakness caused by low blood pressure;

* lemon balm, cinnamon, rosemary, mint oils are used for circulatory disorders;

* rosemary helps in case of heart diseases, strengthens vessel walls, in case of circulatory disorders;

* lemon balm, ylang-ylang, marjoram and frankincense oils are used for hypertension and hypotension.

- Phytotherapy
- Vitamin therapy
- Music therapy
- Kinesitherapy
- Reflexology
- Colour therapy

3. The immune system unites organs and tissues that protect the body from genetically foreign cells or substances that enter the body from the environment or are formed in the body. There are central organs of the immune system (bone marrow, thymus) and peripheral organs (spleen, lymph nodes, as well as the lymphoepithelial ring of the pharynx and unencapsulated scattered lymphocyte clusters of the gastrointestinal tract, bronchi and genitourinary system).

The bone marrow (red) is the main organ of haematopoiesis and produces immune defence cells – B-lymphocytes and T-lymphocytes.

The thymus (sternum) is an unpaired organ, shaped like a two-toothed fork, located in the chest cavity and partially in the neck. The anterior surface of the thymus is adjacent to the back surface of the sternum and sternum body. It promotes the differentiation and maturation of T-lymphocytes. The thymus reaches its maximum weight of 37.5 g in early childhood and before puberty. At the age of over 16 years, the weight of the gland gradually decreases, and at the age of 50-90 years, the weight of the organ is 13.4.

The spleen is an unpaired organ, shaped like a hemisphere. The spleen weighs 150-200 g. The spleen is located in the abdominal cavity, in the left hypochondrium. The spleen is almost a quarter of the body's lymphoid tissue and a powerful army of macrophages. The spleen destroys red blood cells ("red blood cell

cemetery"), forms leukocytes and lymphocytes.

Lymph nodes are the most numerous organs of the immune system. A lymph node is oval in shape. The number of lymph nodes in a group ranges from 2-12 to 6-400. They are found in most organs and are formed at the junction of lymphatic vessels. Lymph nodes lie in groups along the path of lymphatic vessels that go from organs and tissues to lymphatic trunks and lymphatic ducts. Lymph nodes are a barrier to infection entering our body and spreading through the body. They participate in the body's defence reactions and work as filters in the lymphatic circulation system.

The regional lymphatic system is represented by scattered encapsulated lymphoid elements that are connected to the mucous membranes. At the intersection of the respiratory tract and the digestive tract, there is a Waldeyer-Pirogov ring that consists of the following clusters: palatine, tubular, pharyngeal and lingual tonsils. The trachea and bronchi also contain diffuse lymphoid accumulations. Bronchial-associated lymphoid tissue also includes lymphatic elements of the lower respiratory tract and the portal lymph nodes. This is where IgA is produced and secreted in response to inhaled antigens. Lymphoid elements are also present in the mucous membranes of the respiratory tract, gastrointestinal tract, genitourinary tract, and in the submucosal layer of the genitourinary tract. The lymphoid tissue associated with the intestine is very rich and includes lymphoid components of the intestine – peyer's plaques, appendix lymphoid accumulations.

Effective implementation of the protective functions of the immune system leads to the formation of immunity to certain antigens, and disruption of its functioning leads to the development of immunopathologies. Immune reactions aimed at recognising, neutralising and eliminating foreign structures are called the immune response. There are two types of immunity: nonspecific, congenital or hereditary (skin, mucous membranes, lysozyme, compliment system, phagocytes) and specific, acquired or adaptive. There is also a distinction between humoral immunity (can be nonspecific (lysozyme, gastric hydrochloric acid, interferons) and specific immunity (associated with special proteins – antibodies or immunoglobulins) – carried out by B lymphocytes and cellular immunity (can also be specific and nonspecific) – specific

immunity is associated with T-lymphocytes, nonspecific cellular immunity is carried out by NK cells ("natural killers") and phagocytes, for example, macrophages (absorbing bacteria).

There are also active and passive immunity. Active immunity occurs after an illness (natural) or after the administration of a vaccine (artificial). Passive immunity is associated with the influence of environmental factors. For example, a newborn baby's blood contains antibodies that he or she received from the mother through the placenta or receives with mother's milk. This is how natural passive immunity is formed. Artificial passive immunity occurs after the administration of therapeutic serum with ready-made antibodies (vaccination).

Disorders of the immune system functioning:

• Immunodeficiency is formed when the immune system is not working effectively enough. It can be congenital (primary) and acquired (secondary). The most famous example is AIDS.

- An allergic reaction is an increased sensitivity of the body's immune system to certain, usually safe, antigens. Such substances are called allergens.

- Autoimmune diseases – occur when the immune system attacks its own cells. Examples of such diseases are: - type I diabetes mellitus; - rheumatoid arthritis; - autoimmune thyroiditis; - systemic lupus erythematosus; - systemic scleroderma; - vasculitis; - deforming osteoarthritis (Bechterev's disease); - multiple sclerosis; - ulcerative colitis; - crohn's disease and others.

The immune system is closely related to the cardiovascular system, in particular the blood.

Health technologies that help strengthen the immune system:

breathing exercises

sound gymnastics

immune gymnastics

hydroaerobics

aromatherapy:

* against infections of viruses, bacteria, fungi: lavender, tea tree and geranium oils;

* tea tree and lavender essential oils have antiseptic properties;

* a mixture of pine, mint and lavender oils kills mould, germs and staphylococci;

* lemon essential oil has bactericidal properties. Thus, oil vapour neutralises meningococcus in 15 minutes, pneumococcus in 1-3 hours, Staphylococcus aureus in 2 hours, streptococcus in 3 hours, typhoid bacteria and staphylococcus in 5 minutes, diphtheria bacillus in 20 minutes (data from Sechenov Research Institute in Yalta);

* for ARVI, flu: lemon, cypress, pine, fir, eucalyptus, cedar oils have a stimulating effect on the immune system;

* for herpes: lemon, tea tree;

* Neroli essential oil stimulates the production of active substances that suppress viruses, and citrus fruits ozonate the air and cleanse it of harmful viruses;

* Aromatic oils such as ginger, lemon, thyme, sandalwood, rosemary tone up and restore the body after prolonged illnesses;

* lavender, mint and chamomile oils have anti-inflammatory effects;

* lavender oil increases the body's resistance to infectious diseases, antiviral and antibacterial agent for colds and viral diseases;

* eucalyptus oil strengthens the immune system, is used in case of colds;

* rosemary oil stimulates the body's defences;

* Siberian pine oil restores strength after stress and illnesses, strengthens immunity, has antiseptic, anti-inflammatory, expectorant, antipyretic effect in case of colds and viral diseases, eliminates weakness and lethargy after illnesses;

* juniper oil is an effective tonic and general restorative agent, a powerful antiseptic in case of colds and viral diseases;

* eucalyptus oil, fennel oil, clary sage oil are used to destroy infection in case of colds, juniper oil also has bactericidal properties;

* rose oil is a good antiseptic;

* cornflower, jasmine, clove, eucalyptus, sage oils have an immunomodulatory effect on T and B lymphocytes.

- Phytotherapy

- Vitamin therapy

- Music therapy
- Art therapy
- Reflexology
- Colour therapy

4. The nervous system is a set of cells and body structures created by them, which in the process of evolution of living beings have achieved high specialisation in the regulation of adequate vital activity of the organism in constantly changing environmental conditions. The structures of the nervous system receive and analyse various information of external and internal origin, and form the body's response to this information. The nervous system also regulates and coordinates the mutual activity of various organs of the body in all living conditions, provides physical and mental activity and creates the phenomena of memory, behaviour, information perception, thinking, speech, etc.

All processes in the body are directed and controlled by the nervous system. The brain, its highest part, controls the functioning of all organs and systems of the body, which helps to communicate with the environment in which a person lives.

The nervous system goes through a long developmental process. At the time of birth, the child's brain is still immature in morphological and functional terms. A newborn baby has only unconditioned reflexes: sucking, swallowing, defence, etc. However, already in the first months of life, conditioned reflexes to complex stimuli appear. In the third or fourth month of life, the first conditioned orientation reflexes are observed. Later, they form faster and begin to play a significant role in the child's behaviour.

The most complex frontal areas of the brain are fully developed by the age of six or seven. In these parts of the brain, there is a rapid development of associative zones, in which mental processes are formed that lead to the identification of complex intellectual actions of preschoolers. Significant morphological restructuring of the child's brain structures is accompanied by more significant changes in brain activity and affects the child's mental functions.

According to the physiological doctrine of I.P. Pavlov, the process of complex adaptation of the body to the environment is carried out by the cerebral cortex

primarily through conditioned reflex activity. The main form of activity of the higher nervous system is a reflex – a response to a stimulus. The first group of reflex reactions is made up of unconditional (natural) reflexes. They provide the child with biological adaptation to the environment and are mainly associated with three types of activity – eating, breathing and orientation.

On the basis of unconditioned reflexes, more sophisticated reactions are formed – the so-called conditioned reflexes, thanks to which the body adapts to environmental conditions. Skills and habits are the chains of conditioned reflexes that arise when a child interacts with the environment. Therefore, the formation of certain motor skills in children is regarded as the creation of higher-order conditioned reflexes based on existing ones.

It is important to take into account another significant feature of the child's central nervous system – the ability to retain traces of the processes that have taken place in it. This explains why children are so receptive and remember so much and easily. However, many repetitions are necessary to consolidate and improve what they have learnt. This should not be forgotten when developing certain motor skills.

High excitability, reactivity, and high plasticity of the nervous system in childhood contribute to better, and sometimes faster, learning of complex skills in basic movements (climbing, jumping) and sports exercises (skiing, swimming, etc.) than in adults. Moreover, the correct formation of motor skills in preschoolers from the very beginning is of great importance (these mistakes in teaching children to do physical exercises are very difficult to correct later).

Exercise improves the tone of the child's body. They speed up blood circulation, increase respiratory function, improve metabolism, and make the cardiovascular system more resistant to negative environmental influences. Proper physical education of children is unthinkable without taking into account their psychological specific features. In preschool age, involuntary attention reaches a fairly high level. However, at this time, voluntary (intentional) attention also begins to form, which arises in the process of a child's biological development and under the influence of educational work with them. However, children cannot yet consciously concentrate. Fatigue is the main enemy of their attention. Children get tired especially quickly

from monotonous work or monotonous physical exercises.

You should also be aware of the characteristic features of preschoolers' psyche; it is difficult for them to force themselves to sit in one place and do some work for a long time. The processes of excitation in the child's central nervous system prevail over the processes of inhibition. Therefore, it is necessary to gradually develop in children the ability to restrain themselves, limit their desires, teach them to obey, and fulfil the requirements of the educator during physical exercises.

Health technologies that help strengthen the nervous system:

- Breathing exercises
- Immune gymnastics
- Finger gymnastics
- Hydro aerobics
- Psychogymnastics
- Aromatherapy:

* lavender, mint and chamomile oils are blended to relieve headaches, and they also have soothing properties;

* ylang-ylang, jasmine, rosemary and lavender essential oils will help reduce stress, while basil, rosemary and grapefruit will promote mental clarity and are also useful in case of tension;

* during daytime sleep, lavender essential oil should be used to calm children;

* to stimulate the brain: essential oils of grapefruit, lemon, orange;

* to improve memory and attention: grapefruit, rosemary, lemon, lavender;

* to relieve childhood anxiety: bergamot, rose and mint oil;

*to relieve tension and nervousness, especially at the beginning of the school year: aromas of geranium, lavender or ylang-ylang;

* to calm a child who is too excited, crying, waking up at night: anise, rose, frankincense, sandalwood and orange oil;

* overcoming the complex "I'm bad" and "I can't do anything": marjoram, basil, geranium, orange and cinnamon oils

* in case of poor adaptation to new social conditions (kindergarten): lemon;

* in case of aggression: lavender and frankincense oil;

* for apathy: juniper;

* to relieve stress: lavender, ylang-ylang, rosemary or citrus oils - orange, mandarin, bergamot;

* thyme, lavender and ginger oils will help with headaches, as well as basil, marjoram or lemon oil in combination with a facial massage;

* pine, mint and citrus essential oils will help to get rid of apathy and fatigue;

* For a good night's sleep, you should use chamomile, lavender, rose and vanilla essential oils;

* to wake up quickly: grapefruit, geranium and jasmine oils;

* oregano, bergamot, jasmine, lavender, frankincense and linden oils have a calming and sleep-inducing effect;

* lavender oil soothes nervousness, insomnia, irritability, eliminates symptoms of fatigue, stimulates cerebral blood circulation;

* fir oil strengthens the nervous system, tones up, eliminates depressed mood;

* Siberian pine oil stimulates mental activity and memory, relieves fatigue;

* juniper oil restores mental balance in case of stress and anxiety;

* lavender, sage, nutmeg and thyme oils are used for fatigue, fir, geranium and mint oils for neurasthenia;

* eucalyptus oil quickly restores the body after stress, during physical activity;

* peppermint soothes, is useful in case of stress, relieves headache and muscle pain, normalises pulse, improves mood, helps to get rid of fears, depression, improves appetite;

* geranium oil is used in case of nervous system disorders, neuroses, headaches, insomnia, helps to overcome depression, tension, tearfulness;

* sandalwood oil is used for insomnia, fears, apathy.

- Phytotherapy
- Vitamin therapy
- Bibliotherapy
- Laughter therapy
- Music therapy
- Art therapy

- Kinesitherapy
- Reflexology
- Game therapy
- Sand therapy
- Colour therapy

5. The digestive system is a set of digestive organs involved in the digestion of food. Digestion is the process of physical (grinding, rubbing, dissolving) and chemical processing of food to transform it into simple and soluble compounds that can be absorbed, transported by the bloodstream and assimilated by the body. The most important stage of this process is the chemical separation of food components, which takes place with the participation of enzymes (biological catalysts). In the process of digesting food, proteins are broken down into amino acids, fats are broken down into glycerol and fatty acids, and carbohydrates are broken down into monosugars (glucose, etc.). Chemicals in food, such as water, vitamins, microelements and inorganic components, are absorbed by the body unchanged, so they are not converted and do not require enzymes for digestion.

The human digestive system consists of the mouth, which has lips, teeth, tongue, taste buds and salivary glands; pharynx; oesophagus; stomach, small, large and rectum. The digestive system also includes the liver and pancreas.

In the oral cavity, the process of food digestion begins – physical and chemical processing of food, determining its taste and other qualities. The teeth and tongue are used to mechanically break down food. In addition to grinding, food in the oral cavity is subject to moisturising and primary processing by alkaline salivary enzymes that break down carbohydrates (mainly starch). The greatest intensity of saliva secretion is observed at the age of 9-12 months.

The process of digestion of carbohydrates that begins in the mouth continues in the oesophagus and stomach until gastric juice (acid reaction) neutralises the action of salivary enzymes. By swallowing chewed food is moved from the mouth to the pharynx, oesophagus and stomach.

The stomach is the widest part of the digestive tract and holds between 0.2 and 0.6 litres of food in children. In the stomach, food is further digested by gastric juice.

The processes of cellular differentiation of the gastric mucosa in children last from birth to 7 years, and the function of hydrochloric acid synthesis in children begins to develop actively at the age of 2.5-4 years. According to M.M. Bezrukykh, in children aged 7 years, the acidity of gastric juice is approximately 36% of that of adults. Reduced acidity of gastric juice in children causes its reduced bactericidal activity and predisposition to gastrointestinal diseases. The low acidity of gastric juice also causes the fact that in children under 1.5-2.5 years of age, gastric pepsin is able to digest only milk proteins. Children also have a significantly increased activity of gastrin formation, which is why children have an accelerated rate of food digestion compared to adults and therefore need more frequent meals, which should be taken into account when choosing the composition of food and diet.

After the stomach, food passes into the small intestine (duodenum) for further digestion and absorption, where the pancreatic ducts and gallbladder open, and bile from the liver enters.

The liver is the largest gland in the body, located in the right hypochondrium. The most important function of the liver is to neutralise toxins that are formed in the body or enter the body with food or water. The weight of a newborn baby's liver is 150 g, and that of an adult is 1500 g.

The small intestine is a kind of endocrine organ. The intestines grow most intensively from 1 to 3 years. From the small intestine, digested food enters the large intestine for further absorption, and then into the rectum.

Health technologies that help strengthen the digestive system:

- Sound gymnastics
- Immune gymnastics
- Finger gymnastics
- Hydro aerobics
- Aromatherapy:

* peppermint oil eliminates toothache and inflammation of the oral cavity;

* cinnamon and clove oils affect the function of the intestines;

* internal use of black pepper, grapefruit, tangerine oils, as well as olive, sesame, linseed, hemp, coconut oils, which contain saturated fats that are beneficial

for the liver, stomach (coconut oil promotes healing of the mucous membrane), and they also contain amino acids, microelements;

* ganousse, fennel, mint, lavender oils are used for diseases of the gastrointestinal tract;

* peppermint oil is effective for abdominal pain.

- Phytotherapy:

* drinking mint and ginger tea helps relieve abdominal pain and bloating;

* turmeric is useful for stomach disorders, for prevention of liver diseases, it is useful for diabetes mellitus, Crohn's disease;

* tea with St. John's wort, tansy, yarrow, plantain, immortelle will help to normalise the functioning of the gastrointestinal tract.

- Vitamin therapy
- Music therapy
- Kinesiotherapy
- Reflexology
- Colour therapy.

6. The excretory system is an organ of excretion that plays an important role in maintaining the stability of the internal environment of the body by removing excess decay products, excess water and salts. This function involves the lungs, digestive organs (liver, intestines), skin, and the urinary system (kidneys, bladder, urinary tract - urethra).

The lungs remove carbon dioxide, water vapour, and volatile substances (ketone, acetone, etc.) from the body. The digestive system removes heavy metal salts, toxic substances, and residues of breakdown products of proteins, fats, and carbohydrates along with undigested food. The urinary system removes water, salts, ammonia, urea, uric acid, poisonous and toxic substances, varnish residues, etc. from the body. The kidneys are able to filter out unnecessary and harmful substances from the blood and excrete them along with excess water. Children produce more urine than adults. On the skin, the sweat and sebaceous glands perform the function of excretion. Sweat glands eliminate water, salts and organic substances.

The skin covers the entire human body, the top layer is called the epidermis.

Additional skin structures include nails and hair. The human skin performs the following functions: it creates the outer shell of the body, perceives various irritations, protects the body from germs and mechanical damage, performs secretory (sebum secretion) and excretory (sweating) roles, and participates in thermoregulation.

Sweat glands perform two important functions: secretion and thermoregulation. At the time of birth, a child has 2.5 million sweat glands, the number of which does not change with age. According to A.G. Khripkova, in the first three weeks of a child's life, the sweat glands are almost non-functional. The morphological development of sweat glands in children is completed by the age of 7-8 years.

The thermoregulatory function of the sweat glands is based on the fact that the body is cooled by the evaporation of sweat, which prevents overheating. Children have a relatively larger heat-regulating skin surface than adults. The consequence of imperfect heat regulation in children is their frequent hypothermia and colds in the cold season.

Children's sebaceous glands begin to function effectively from the first days of birth.

Health technologies that help strengthen the excretory system:

- Hydro aerobics
- Aromatherapy:

* to care for problem skin and eliminate redness: tea tree, chamomile and sage oil;

* tea tree oil, lavender, clove, juniper oil eliminates pustular, acneous skin rashes;

* tea tree oil, lavender oil reduces inflammation, irritation and itching of the skin;

* tea tree oil, lavender oil eliminates herpetic skin rashes;

* tea tree, lavender, rosemary oil heals hair, eliminates dandruff and hair loss;

* lavender, mint, eucalyptus oil eliminates skin peeling, promotes wound healing, in particular from insect bites, regenerates affected skin areas after burns, wounds, frostbite;

* chamomile and marjoram oils promote wound healing, and chamomile oil also prevents the formation of keloids;

* rosemary oil tones the skin, treats furunculosis, reduces hypersecretion of oily skin, removes toxins and excess fluid from the tissues;

* juniper oil is used for dermatitis, purulent rashes;

* rose oil has a positive effect on the skin;

* sandalwood oil is used for dermatitis, itching;

* cornflower, clove, rosemary, fennel oils have antioxidant properties, which helps to prevent the accumulation of under-oxidised products and free radicals in the body and promote their elimination;

* juniper, myrtle, cayaput, pine, santalum, eucalyptus oils are used for kidney diseases.

- Phytotherapy
- Vitamin therapy
- Music therapy
- Kinesitherapy
- Reflexology
- Colour therapy.

7. The musculoskeletal system consists of the skeleton (bones), muscles, ligaments and joints. These structures protect the internal organs from damage and enable movement.

The skeleton forms the structural basis of the body, determines its shape and size. The skeleton consists of the spine, chest, skull, upper and lower limbs. A child's skeleton has about 300 bones (while an adult has 206). Bones are also involved in metabolic processes: they accumulate mineral salts, and bones contain haematopoietic tissue – red bone marrow.

The muscular system consists of three types of muscles: skeletal, heart, and smooth muscles of internal organs and blood vessels. The active part of the musculoskeletal system is skeletal muscles, the total number of which in a child's body is more than 640 (as in an adult).

All muscles in the human body are divided into: facial and chewing muscles;

muscles of the head, neck, back, chest, abdomen, upper and lower limbs. During the course of a child's development, some muscles and muscle groups grow unevenly: from birth to 1 year, the chewing muscles of the face, abdominal and back muscles develop more rapidly; from 1 year to 5 years, the muscles of the chest, back and limbs develop intensively.

The most important quality of muscles is their strength, which depends on the number of muscle fibres per unit area of the muscle cross-section. Muscles can perform static and dynamic work. Static work requires the simultaneous contraction of many muscles and therefore causes fatigue. Dynamic work involves individual muscles contracting alternately: acts of contraction alternate with relaxation, so fatigue occurs much more slowly.

Exercise is a fundamental condition for muscle development. Without work, they atrophy and lose their efficiency. Muscle strength in children under 3 years of age is low, and only from the age of 4-5 years begins to grow gradually.

An important functional indicator of the state of the muscular system is the speed of movements (single-act, complex motor acts). The increase in the speed of motor acts with the age of the child is associated with an increase in the speed of nerve impulses along the nerves, as well as with an increase in the speed of transmission of excitations in neuromuscular synapses. The development of the speed of both single-act and complex motor acts in children can be significantly accelerated by special training.

An important quality of movement is its accuracy, which also changes with age. Children under 5 years of age have difficulty making precise movements. Mastering the accuracy of movements is associated with the maturation of the higher centres of motor control and the improvement of reflex pathways, in particular, with the processes of nerve fibre myelination. Along with the development of movement accuracy, children develop the ability to coordinate the level of muscle tension. The development of movement precision and the ability to static muscle tension significantly contribute to mastering calligraphic writing, performing complex labour operations (e.g. working with plasticine), special physical exercises (e.g. gymnastics, table tennis, ball exercises).

Health technologies that help strengthen the musculoskeletal system:

- Fitball gymnastics
- Breathing exercises
- Sound gymnastics
- Immune gymnastics
- Finger gymnastics
- Hydro aerobics
- Aromatherapy:

* lemon balm, cinnamon, rosemary, mint, and eucalyptus oils are used for joint pain;

* rosemary helps with rheumatic pains;

* Siberian pine, juniper, chamomile, ginger, clove, eucalyptus, lavender oils eliminate pain, swelling and inflammation in arthritis, arthrosis and osteochondrosis;

* juniper, chamomile, rosemary, cayaput, ginger, clove, eucalyptus, lavender oils are useful in complex, rehabilitation and preventive therapy for disorders of the musculoskeletal system;

* eucalyptus, thyme, juniper, rosemary, chamomile, mint oil helps with muscle pain;

* marjoram oil helps with muscle spasms and cramps).

- Phytotherapy
- Music therapy
- Kinesiotherapy
- Reflexology
- Sand therapy.

Lecture 8-9: Characteristics of physical development of preschool children and its control

Plan

1. The concept of physical development and its indicators.

2. Control over physical development: morphological (anthropometric) indicators.

3. Control over physical development: somatoscopic indicators.

4. Control over physical development: physiometric (functional) indicators.

5. Monitoring of children's health.

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

2. Diagnostic methods for assessing the physical condition of preschool children and preventive exercises to improve it: a textbook. 2nd edition, supplemented / authors-compilers E.S. Vilchkovskyi, O.I. Kurok, N.O. Khlus. Vinnytsia: Tvory LLC, 2023. 63 p.

1. The physical development of preschool children, along with illness, is one of the most important indicators of the health of the child population in Ukraine. In the general system of studying the state of health of children, physical development examination occupies a significant place and is carried out systematically at certain intervals. Physical development is understood as a set of morphological and functional characteristics of the body that characterise the processes of growth and maturation of the body, i.e. the age level of a child's biological development. Physical development is subject to biological laws, reflecting the general laws of growth and development. It depends on many factors. First and foremost, it is the course of pregnancy and childbirth, as well as the state of health of the mother. After the birth of a child, endogenous and exogenous factors influence physical development. Endogenous factors include the endocrine glands (thymus, pituitary, thyroid). Endogenous factors are the conditions in which a child lives and develops. The physical development of children is significantly affected by the climate, living conditions, daily routine, and diet. The pace of physical development is also influenced by hereditary factors, type of constitution, metabolic rate, activity of blood enzymes and digestive gland secretions, etc.

At the same time, physical development reflects the overall level of social and hygienic living conditions. It directly depends on the state of health. This includes,

for example, diseases caused by endocrine disorders (gigantism, acromegaly, infantilism), chronic diseases (rheumatism, tuberculosis intoxication). Children who are frequently and prolongedly ill experience weight loss, weakening of muscle tone, and postural disorders. It has been proven that rickets and chronic dysentery in young children delay their physical development. Thus, health and physical development are directly related and dependent on.

2. The following indicators and research methods are used to assess children's physical development, and the data obtained are compared with the assessment tables of children's physical development (standards for the region).

1. Morphological (somatometric): length and weight of the body, chest circumference, and in children under three years of age – head circumference.

2. Somatoscopic: condition of the musculoskeletal system (shape of the chest, spine, limbs), type of constitution, condition of the skin and visible mucous membranes, degree of fat deposition.

3. Physiometric (functional): state of the cardiovascular system, vital capacity of the lungs (VCL), muscle strength of the hands (dynamometry).

The main indicators used to assess the physical development of young children and preschoolers are height (body length), body weight, chest circumference, head circumference, as well as the condition of the skin and mucous membranes and the degree of fat deposition. You can monitor your child's growth by regularly measuring their body length and checking their weight. Weight, height and chest circumference are indicators that indicate the development of the musculoskeletal system, internal organs and the presence of fat tissue. Anthropometric examinations are performed using the generally accepted methodology of O. Stavytska and D. Aron.

Body length (height). Due to its minimal exposure to external influences, body length is considered as a baseline for assessing children's physical development. Children's height is measured using a height meter, barefoot, and the data is recorded to the nearest 0.5 cm. The child stands upright, touching the scale of the height meter with the body between the shoulder blades, buttocks and closed heels, arms down, head straight. The movable bar of the height meter is lowered until the head is firmly in contact. The data obtained are compared with the average values (Table 1).

Table 1

Physical development of preschool children

(anthropometric indicators)

Age	Gender	Levels of physical development				
		high	above average	average	below average	low
1	2	3	4	5	6	7
Body weight						
3 years	Boys	18,7	18,6-17,3	17,2-14,1	14,0-12,6	12,5
	Girls	18,5	18,4-16,9	16,8-13,8	13,7-12,4	12,3
3 y.6 m.	Boys	19,1	19,0-17,8	17,7-14,7	14,6-13,3	13,2
	Girls	18,7	18,6-17,7	17,6-14,2	14,-13,0	12,9
4 years	Boys	19,6	19,5-18,3	18,2-15,3	15,2-13,9	13,8
	Girls	18,9	18,8-17,5	17,4-14,7	14,6-13,6	13,5
4 y.6 m.	Boys	21,2	21,1-19,7	19,6-16,0	15,9-14,4	14,3
	Girls	20,4	20,3-18,3	18,2-15,7	15,6-14,2	14,1
5 years	Boys	22,9	22,8-21,0	20,9-16,8	16,7-14,9	14,8
	Girls	21,9	21,8-20,2	20,1-16,6	16,5-14,9	14,8
5 y.6 m.	Boys	23,9	23,8-22,1	22,0-18,1	18,0-16,2	16,1
	Girls	23,8	23,7-21,8	21,7-17,6	17,5-15,6	15,5
6 years	Boys	25,0	24,9-23,2	23,1-19,5	19,4-17,6	17,5
	Girls	25,9	25,8-23,5	23,4-18,6	18,5-16,2	16,1
6 y.6 m.	Boys	26,7	26,6-24,7	24,6-20,3	20,2-18,3	18,2
	Girls	27,5	27,4-24,9	24,8-19,7	19,6-17,6	17,5
Body length						
3 years	Boys	108	107-104	103-93	92-88	87
	Girls	107	106-102	101-91	90-86	85
3 y.6 m.	Boys	109	108-105	104-96	95-91	90
	Girls	108	107-104	103-94	93-90	89
4 years	Boys	111	110-107	106-99	98-94	93

	Girls	110	109-106	105-98	97-94	93
4 y.6 m.	Boys	114	113-110	109-102	101-97	96
	Girls	113	112-109	108-101	100-96	95
5 years	Boys	117	116-113	112-105	104-101	100
	Girls	116	115-113	112-105	104-102	101
5 y.6 m.	Boys	120	119-117	116-108	107-104	103
	Girls	120	119-116	115-108	107-103	102
6 years	Boys	124	123-121	120-112	111-108	107
	Girls	124	123-120	119-111	110-107	106
6 y.6 m.	Boys	128	127-124	123-115	114-111	110
	Girls	127	126-123	122-114	113-109	108
Chest circumference						
3 years	Boys	59	58-56	55-50	49-47	46
	Girls	58	57-55	54-49	48-47	46
3 y. 6 m.	Boys	59	58-57	56-51	50-48	47
	Girls	58	57-56	55-50	49-48	47
4 years	Boys	60	59-58	57-52	51-50	49
	Girls	59	58-56	55-51	50-49	48
4 y.6 m.	Boys	61	60-59	58-53	52-51	50
	Girls	60	59-56	55-52	51-50	49
5 years	Boys	62	61-60	59-54	53-52	51
	Girls	60	59-57	56-53	52-51	50
5 y.6 m.	Boys	63	62-61	60-56	54-53	52
	Girls	62	61-59	58-54	53-52	51
6 years	Boys	65	64-63	62-57	56-54	53
	Girls	64	63-62	61-56	55-53	52
6 y.6 m.	Boys	66	65-64	63-58	57-55	54
	Girls	65	64-63	62-56	55-53	52

The height of a full-term infant at birth ranges from 45 to 52 cm. At the end of the 1st year of life, the average height is 70-75 cm; the second – 85 cm; the third – 95

cm; the sixth – 110-115 cm. During the first year of life (on average): a) a child grows by 25 cm; b) during the second – by 10 cm; c) during the third – by 10 cm; d) during the fourth – by 8 cm; e) during the fifth – by 7 cm; f) during the sixth – by 5 cm.

The average height of a child over one year old can be determined by the formula: 75 cm + 5 cm x n), where n is the number of years. So, at the age of 6, the height should be: 75 cm + (5 cm x 6) = 105 cm. A child's height can also be determined by another formula. At the age of 4, the child's height is 100 cm. If the child is less than 4 years old, his/her height is equal to: 100 cm – 8 (4 – n), where n is the number of years. If the child is more than 4 years old, his/her height is equal to: 100 cm + 6 (n – 4).

Different parts of the child's body grow differently, most intensively – the lower limbs, their length increases 5 times during the entire period of growth, while the length of the upper limbs increases 4 times, the torso – 3 times, and the height of the head – 2 times. The head of a newborn child is about 1/4 of the length of the whole body, the head of a 6-year-old child is 1/6 and that of an adult is 1/8. The length of different parts of an infant's body differs from that of an older child.

Body weight. To provide the most objective data, children's body weight is measured using a medical scale in the morning before breakfast after using the toilet, in lightweight clothing; the data is recorded to the nearest 50 g. The data obtained are compared with the average values (Table 1).

Normally, a full-term baby can be born with a body weight ranging from 2500 g to 4 kg; the average body weight of infants is 3400-3500 g for boys and 3200-3400 g for girls. The figures for infant weight are only indicative. They gain weight at approximately the following rates: during the first 3 months – 25 g per day (750 g per month); from 3 to 6 months – 20 g per day (600 g per month); from 6 to 9 months – 15 g per day (450 g per month); from 9 to 12 months – 8-10 g per day (250-300 g per month). The approximate monthly weight gain during the first year of life can be determined by the formula: 800 g - (50 x n), where n is the age in months. Thus, at the 6th month, the child's body weight should increase by 500 g (800 g-(50x6).

The appropriate weight for a child in any month of the first year of life can be roughly determined by the following formula: appropriate weight = birth weight + (a x p), where a is 650 g for the first six months and 550 g for the second six months. Thus, a child born with a body weight of 3500 g should weigh 7 months at birth: 3500 + (550 x 7) = 7350 g. More precisely, the body weight in the first year of life can be determined by the formula given by K. Mazurin and I. Vorontsov: for the first half of the year, according to this formula, the body weight is equal to weight at birth + (800 x n), where n is the number of months, 800 is the average monthly weight gain during the first half of the year. For the second half of life, body weight is equal to: weight at birth + (800 x 6) (weight gain for the first half of the year) - 400 g x (n - 6), where 800 g x 6 is the weight gain for the first half of the year; n is age in months; 400 g is the average monthly weight gain for the second half of the year.

At the age of five months or earlier, a child's body weight doubles, and by 12 months, it triples. Small deviations from the average are not particularly significant. Only a significant difference in body weight indicates that the child is not developing sufficiently. Therefore, parents should regularly weigh their infant, and it is best to bring him or her to the clinic on patronage days to check the weight.

After the first year of life, the rate of weight growth gradually decreases, increasing only during puberty. Approximately, the body weight of a child aged 2-11 years can be determined by the formula: 10 kg + (2 x n), where n is the number of years. For example, a child aged 6 should weigh: 10 kg + (2x6) = 22 kg. After a year and up to 7-8 years, the average weight gain is 2 kg.

The chest circumference is also measured with a centimetre tape to the nearest 0.5 cm, holding it at the level of the papillae in front and under the shoulder blades (Table 1).

The head circumference is measured with a centimetre tape, passing through the frontal convexity in front and the occipital convexity in the back. The data obtained are compared with the average values.

In the overall assessment of physical development, attention should be paid to the harmonious development of children, because the harmonious combination of anthropometric features (body length and weight, chest circumference) is of primary

importance for characterising the level of physical development. It is known that overweight is one of the main risk factors for cardiovascular diseases, posture disorders, and metabolism in children.

The proportionality of physical development of the body can be determined using anthropometric coefficients. Thus, the proportionality of body length and weight, and chest circumference (CC) is determined by the Pinier index (PI) (Table 2).

PI = height, cm - [weight, kg + CC, cm]

The lower the Pinier index, the more proportionate the child's body structure.

Table 2

Assessment of physical development of preschool children

Indicators of Piniot index in children aged 5-6 years

Age, years	Boys	Girls
5	34,2	34,7
6	36,1	37,0

3. An in-depth medical examination must include a detailed description of the child's musculoskeletal system. First of all, the condition of the bone system is examined – the presence of deformities and their degree. Each child's posture, the shape of the legs and feet are examined. In preschool age, posture disorders and foot deformities are most often functional in nature and are determined mainly by insufficient development of muscles and ligaments.

The musculoskeletal system supports a person in an upright position (bones of the spine and lower limbs). The protective function is performed by the bones of the skull, spine, chest, pelvis, and abdominal muscles, protecting the brain and spinal cord, lungs, heart, and abdominal organs from external factors. The motor function is performed by the bones and muscles of the limbs, spine, back and chest muscles.

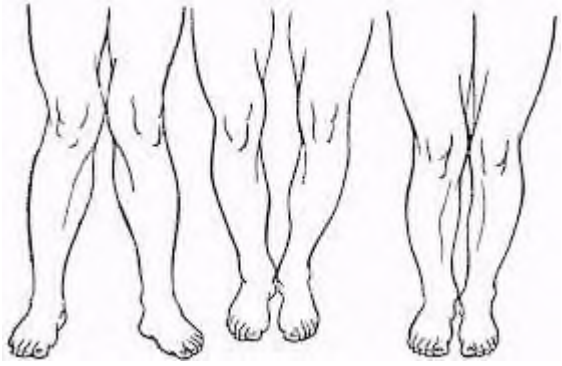
Normally, the spine has curves, and in the frontal projection (when viewed from the front or back), a normally developed spine should be straight. Deviations from the normal shape of the spine can be: a straightened spine, when lordosis and kyphosis are not sufficiently developed for reasons such as a child's lack of mobility; a lordotic or kyphotic spine, when lordosis or kyphosis are increased, respectively. Bending of

the spine to the left or right causes a scoliotic spine shape. Spine shapes create corresponding posture forms: normal, straightened, lordotic, kyphotic (stooped) or scoliotic.

Along with the formation of the spine, children also develop the chest, which acquires a normal cylindrical shape, like in adults, at about 12-13 years of age, and then can only increase in size until the age of 25-30. The most common deviations in the development of the chest shape are conical shape (narrowed to the top) and flattened shape (reduced anterior-posterior dimensions). Various deviations from the development of normal spine and chest forms can negatively affect not only body posture, but also disrupt the normal development of internal organs, and worsen the level of somatic health.

Abnormalities of the spine and chest in children can be caused by incorrect sitting at a desk or table (bending to the side, low bending over the desk or lying down on the edge of the table, etc.), incorrect posture when standing and walking (lowering one shoulder below the other, lowering the head, stooping), physical overload, especially lifting and carrying heavy objects, including in one hand. In order to avoid and prevent abnormalities in the development of the trunk skeleton, it is necessary to comply with the hygienic requirements of working at a desk (desk) and the hygiene of physical activity. Normal development of the spine and chest is greatly facilitated by rational exercise. Systematic exercise strengthens the child's musculoskeletal system and helps prevent postural disorders and flat feet. Specialised exercise can also be one of the most effective measures to eliminate skeletal abnormalities, including stoop, scoliosis, etc.

Leg shape: X-shaped, round, normal.



All the bones of the foot are connected by strong ligaments and, during normal development, the foot itself acquires a concave vault shape, which provides a spring (shock absorber) effect and is associated with upright walking. The arch-shaped foot significantly reduces body shock when walking, running and carrying loads. A newborn baby has no arch of the foot and it is flat. The arch of the foot is formed when the child starts walking and is finally fixed at the age of 14-16 years. During prolonged standing, sitting, carrying heavy loads, wearing narrow and overheating shoes, jumping from heights higher than their height, the ligaments of the foot in children can stretch and then the foot reductively flattens. A person with flat feet gets tired quickly when walking and standing, reduces the speed of running and jumping, and is, in fact, a certain kind of disabled person. To prevent flattening of the foot, you can walk barefoot (especially on sand or pebbles), exercise to strengthen the ligaments of the foot, moderate jumping, running, playing outdoor sports, using comfortable shoes.

Bone maturation is the best evidence of biological maturity. Although bone radiography cannot be used in healthcare practice as a method of systematic examination of every child, it should not be forgotten. At a certain age, points of ossification naturally appear (left hand, foot or knee in an infant or elbow in a school-age child).

Skin and subcutaneous fat layer: a) If the skin colour is pink, it indicates a good blood supply. Pale skin may be caused by anaemia; b) skin elasticity: if you take a healthy child's skin with two fingers and release it, it will straighten immediately. But if the child's body has lost a lot of water, the skin does not have such elasticity and the folds remain for a long time. This is a sign of severe dehydration due to diarrhoea, vomiting, high temperature, etc.; c) muscle tone. In a normal state, muscles never relax completely, but retain a certain degree of tension, which is called tone.

Children's teeth appear at different ages. Sometimes a child is born with one or two teeth. In others, teeth can erupt at 13-14 months. The level of biological development of a child is determined by the indicators of the beginning of the change of milk teeth (Philippine test).

When changing milk teeth, all stages of permanent teeth eruption are taken into account. Scoring of results. 1 point – if the change of milk teeth has begun at the time of the child's entry to school, 2 points – if it has not begun.

The Philippine test is performed as follows: the child stands upright, puts his or her arm over the top of the head, tries to reach the left ear with the fingers of the right hand or the right ear with the fingers of the left hand. The head is held straight. The purpose of the test is to determine the beginning of a half-growth jump in children due to the intensive growth of the musculoskeletal system and brain structures of the central nervous system. It is known that appropriate structural changes in the child's body are a precondition for successful adaptation to learning. Scoring of results. 1 point – the hand reaches the opposite ear, 2 points – it does not.

Some diseases, especially exhausting chronic ones, delay the formation of the bone system and the eruption of teeth. At the same time, accelerated skeletal maturation (for example, in early sexual development) is not accompanied by rapid tooth eruption. Rickets does not always affect the quality of teeth, while the presence of bilirubin in a newborn's blood affects the teeth.

4. One of the most important indicators of the body's functional capabilities is the functional state of the child's cardiovascular system, which plays an important role in the adaptation of the child's body to physical activity. It is possible to identify the state of the cardiovascular system in preschool children using a functional test for dosed physical activity. For an objective assessment of the functional state of the child's body, the method of pulse oximetry is used to determine cardiovascular system parameters: true resting pulse (beats per minute-1) – measured sitting in 10 seconds by palpation; relative resting pulse (beats per minute-1) – measured immediately after standing up in 10 seconds by palpation. Pulse (heart rate) is an objective indicator not only of the state of the cardiovascular system, but also of the impact of physical activity on it. The difference between the actual and relative resting heart rates indicates the tone of the vegetative nervous system before changing the body position in space and depends on the overall level of cardiovascular functioning, as well as on the child's condition at the time of measurement. If during a change of body position from sitting to standing, the

changes in heart rate exceed 12-18 beats per 1 minute, this indicates either a low level of physical development, or general fatigue, or the beginning of a disease.

The test with a change of body position: the child is placed on a couch for 3-4 minutes, after which his or her pulse is measured for 1 minute and blood pressure is measured. Then the child gets up quickly and the same measurements are taken. An increase in heart rate by 4-12 beats per minute and blood pressure of ±5-10 mm after getting up from the couch is considered a good indicator. A greater increase in heart rate and pressure fluctuations of more than 10 mm indicate insufficient regulation of the cardiovascular system.

Dosed muscle load test (30 light jumps in 15 seconds). After a five-minute rest in a sitting position, the child's pulse is counted for 10 seconds, respiratory rate is counted by chest movements, and blood pressure is measured for 30 seconds. Without removing the cuff, the child is asked to perform 30 jumps in 15 seconds and the same measurements are taken again.

In practice, there are two types of reaction. A positive reaction is characterised by an increase in heart rate by 25-50% compared to the baseline, an increase in blood pressure by 10-15 mm and the return of all indicators to the baseline after 2 minutes. In an unsatisfactory condition, a significant increase in heart rate (more than 50%) is observed, a drop in blood pressure, and shortness of breath are noted. Delay of pulse recovery process up to 4-5 minutes indicates inadequacy of physical activity to functional capacities of a child's body.

Assessment of children's health status with regard to functional needs allows to correctly determine the capabilities of the child's body and to more accurately dose physical activity during exercise.

For the purpose of proper dosing physical activity, it is also important to determine the physical performance of children, which is included in the concept of child health and is an integrative indicator of the child's capabilities and is characterised by a number of objective factors. Simple and indirect methods are used to determine children's physical performance. The Rufier test is one of such methods for determining physical work capacity (PWC170) of a child. A child lying on his/her back for 5 minutes is measured a pulse for 15 seconds (P1), then performs 30 sit-ups

for 45 seconds. After that, the child lies down, and the pulse is again counted for the first 15 s (P2), and then for the last 15 s of the first minute of the recovery period (P3). The assessment of heart performance is determined by the formula:

$$Індекс Руф" є = \frac{4(P1 + P2 + P3) - 200}{10}$$

The results are evaluated by the value of the count from 0 to 15. Less than 3 - high performance (5 points); 4-6 - normal (4 points); 7-9 - average (3 points); 10-14 - low (2 points); 15 and above - unsatisfactory (1 point).

Assessment of *the functional state of the respiratory system* of preschool children is carried out by determining the vital capacity of the lungs (VCL) by spirometry. For this purpose, a dry air or water spirometer is taken. The child is asked to exhale as much air as possible through the tube, i.e. to make a maximum exhalation (repeat three times). The spirometer arrow will show the amount of air exhaled. The best of the three attempts is recorded. For further use, the mouthpiece is disinfected in a solution of potassium permanganate or boric acid. The data obtained are compared with the average VCL of preschool children (Table 3).

Table 3

Average indicators of VCL in preschool children

Age	Gender	Indicators of VCL		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	850	840-500	490
	Girls	800	790-400	390
3 y. 6 m.	Boys	920	910-550	540
	Girls	910	900-550	540
4 years	Boys	1000	990-650	640
	Girls	1000	990-650	640
4y. 6m.	Boys	1300	1290-900	890
	Girls	1250	1240-900	890
5 years	Boys	1500	1490-1100	1090

	Girls	1400	1390-1100	1090
5y. 6m.	Boys	1600	1590-1300	1290
	Girls	1550	1540-1200	1190
6 years	Boys	1800	1790-1500	1490
	Girls	1700	1690-1400	1390
6y. 6m.	Boys	1950	1940-1600	1590
	Girls	1900	1890-1500	1490

5. In accordance with the current "Regulation on medical control", an in-depth examination of the health status of children of each age group is carried out twice a year by specialist doctors in the PEI. A detailed conclusion is drawn up on the diagnosis of the disease detected in the child, the health subgroup to which the child belongs according to his or her health condition is determined, and prescriptions are developed for the participation of pre-schoolers in physical education classes. Children with poor health are registered. They are provided with a system of medical and health improvement measures. Based on a comprehensive medical examination (respiratory, cardiovascular, etc.), children are divided into three groups according to their health status.

The first group (the main group) includes children in good health, which corresponds to the age-related norms of psychomotor development, as well as those with minor health deviations. These children participate in all forms of physical education in accordance with the programme.

The second group (preparatory) includes children with physical developmental delays, who are more likely to suffer from catarrh, bronchitis, an over-excited nervous system, functional delay in the development of the nervous system, myopia or tuberculosis intoxication. Children with bronchoadenitis and tuberculosis intoxication in a state of full compensation of the process may be assigned to the main or preparatory group (at the discretion of the doctor). Children in this group perform all physical exercises, except for those that cause significant physical tension (rope climbing, in long and high jumps from a run, the number of repetitions is reduced), the overall load is sometimes reduced.

The third group (special) includes children with significant health disorders, chronic diseases (patients with rheumatism, chronic nephritis, hepatitis, epilepsy, cardiovascular diseases, scoliosis and other postural disorders). They receive therapeutic and corrective exercises from physical therapy instructors under special programmes. Children in this group are restricted from exercises for speed, strength and endurance, reduced running time or distance, etc. When conducting various forms of physical education, they require a mandatory individual approach.

The allocation of children to medical groups is reviewed every six months. If a child in the preparatory medical group improves in health, he or she is transferred to the main group. Or, vice versa, after an illness, a child from the main group is temporarily transferred to the preparatory group.

Lecture 10-11: Formation of correct posture and arch of the foot as an indicator of physical development of preschool children

Plan

1. Features of posture formation in children.
2. Features of the formation of the arch of the foot in children.

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

2. Prevention of diseases and injuries of the musculoskeletal system of children. URL: https://studfile.net/preview/5601874/page:18/

3. Diagnostic methods for assessing the physical condition of preschool children and preventive exercises to improve it: a textbook. 2nd edition, supplemented / authors-compilers E.S. Vilchkovskyi, O.I. Kurok, N.O. Khlus. Vinnytsia: Tvory LLC, 2023. 63 p.

1. Posture disorders are one of the most common diseases of the musculoskeletal system in children. Posture is the usual position of the human body when walking, standing, sitting or working. Correct, or physiological, posture is characterised by a

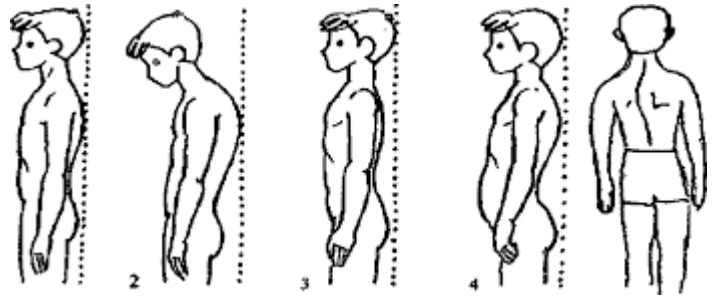
normal spine with moderate natural curves, symmetrical shoulder and shoulder blade position, straight head, straight legs without flattening of the feet. Correct posture ensures the optimal functioning of the musculoskeletal system, the correct position of internal organs and the position of the centre of gravity.

Posture, as a rule, is formed at the age of 6-7 and can change throughout life. However, it should be remembered that the formation and fixation of motor skills that form posture occurs gradually and over a long period of time from an early age. In preschool years, postural disorders can be caused by flattening of the feet, improper posture when drawing or watching TV, etc. Low physical activity combined with overweight are factors that influence the formation of pathological posture during this period. It should be remembered that children's trunk muscles are still underdeveloped, so their posture is unstable. Posture is not a hereditary feature.

The posture and shape of the foot is not an inherent ability, but is formed in the process of growth, development and education of the child. In different periods of children's lives, posture can change under the influence of living conditions and education. Posture is formed in children during the development of their body in close connection with the formation of motor functions. Posture is unstable during the period of increased growth of the child's body, which occurs in the senior preschool age. This is due to the simultaneous development of the child's bone, joint and ligamentous apparatus and muscular system. The strength of the back muscles (especially the spinal extensors), gluteal muscles and abdominal muscles is of great importance for maintaining correct posture. Strong upper back and neck muscles hold the upper body in the correct position, which prevents deformation of the chest.

Incorrect posture negatively affects the functions of internal organs: the work of the heart, lungs, gastrointestinal tract is hampered, lung capacity decreases, metabolism decreases; headaches appear, fatigue increases, appetite decreases, the child becomes lethargic and apathetic. For these reasons, detection of the initial forms of posture disorders and their prevention are most effective in preschool age.

There are the following types of postural disorders: stooped back, round back, flat back, round-concave back, scoliosis, as shown in Pic. 1.



Pic. 1. Types of posture disorders: 1 – correct posture, 2 – round back, 3 – flat back, 4 – round-concave back, 5 – posture disorders in the frontal plane (scoliosis).

Posture examination is carried out in four positions: from the front, side, back (standing) and tilted. When examining a child from the front, attention is paid to the position of the head, the symmetry of the chest and its shape, the level of the nipples, the shape and position of the legs. The shape of the chest can be regular, flattened or flat, hen-shaped, funnel-shaped and barrel-shaped, etc.

A clearer picture of the child's posture is given by a back view (frontal plane). The position of the head, the level of the shoulders and shoulder blades are also examined. With correct posture, the head is raised, the shoulders are symmetrical, of equal length, the shoulder blades are tightly attached to the back, the corners of the shoulder blades are on the same line, the distance between them is 4-6 cm. Preschool children most often have lowered shoulders and pushed back shoulder blades (due to rickets, muscle weakness, or a habit of holding the torso incorrectly).

Different methods can be used to determine lateral spinal curvature. In the simplest of them, dots are applied to the skin at the level of the occipital tubercle, the fifth cervical vertebra, the seventh thoracic vertebra and the fourth lumbar vertebra using a stick stuck into the hole of the height meter, the end of which is moistened with a methylene blue solution. A straight line is drawn through these points. Deviation from it characterises the degree of curvature of the spine.

A more accurate picture of the shape of the spine is obtained by examining the frontal plane in an inclined position. In this case, the child stands in the starting position - heels together, toes apart (with X-shaped feet, the child is asked to stand with the feet slightly apart), tilts his head down, and relaxes his legs. The examiner runs the second and third fingers of the right hand along the spinous processes, starting from the seventh cervical vertebrae down the entire spine of the child, and

then the child is asked to straighten up. The red line on her back will reflect the shape of her spine. Even a slight deviation to the right or left of this line indicates a deviation from the shape, i.e. a scoliotic posture.

A clearer picture of this deviation is given by examining the triangular slit-like gaps located between the inner surface of the lowered arms and torso and their apex at the level of the lower back (waist triangles). Normally, the gaps should be the same shape and size. With the slightest degree of distortion, asymmetry of the waist triangles occurs. Therefore, their comparison is one of the easiest ways to detect scoliosis. In addition, you should pay attention to the symmetry of the folds of the buttocks, knees and ankles.

During the lateral examination (sagittal plane), the degree of formation of the natural curves of the spine is noted. Depending on the shape of the spine, the following postures are determined: normal, straightened, stooped, lordotic and kyphotic.

The correct spine shape is a line with a bend depth of about 4 cm. For such an examination, an anthropometer or a wooden bar 150 cm high and 10 cm wide with divisions (in centimetres) marked on it is used. The child is placed with his or her back to the device so that he or she touches it with the heels, buttocks, and intercostal area of the back, and then the depth of the cervical and lumbar curves of the spine is measured. The data obtained is recorded in the protocol.

PROTOCOL OF SOMATOSCOPIC EXAMINATION OF POSTURE

FULL_NAME_____

Age _____ Gender_____ Notes_____

POSTURE FEATURES Head position: (on the same vertical line with the body, forward, tilted to the right or left)_____

Position of the shoulder girdle (on the same level, the same width of the right and left shoulder, unfolded or forward _____

Spine: severity of curves _____

Back shape (flat, round, round-concave, flat-concave)_____

Blades (normal, wing-shaped)_____

Chest shape (cylindrical, conical, flattened, sunken, asymmetrical, hen-shaped, barrel-shaped)_____

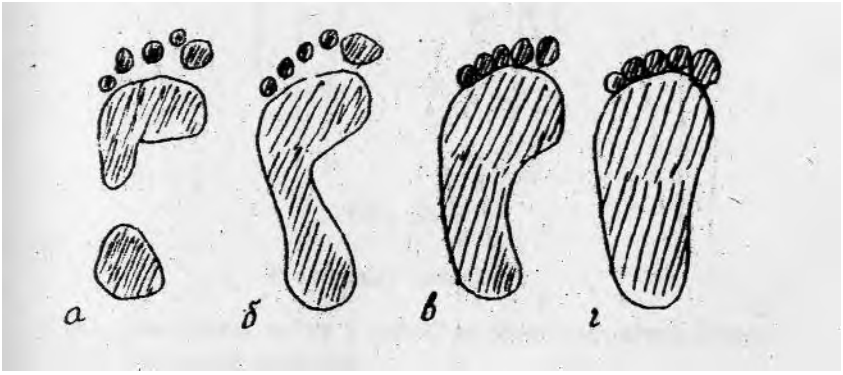
Abdominal shape (straight, sunken, sagging, asymmetrical)_____

General characteristics of posture (correct, stooped, lordotic, kyphotic, scoliotic)_

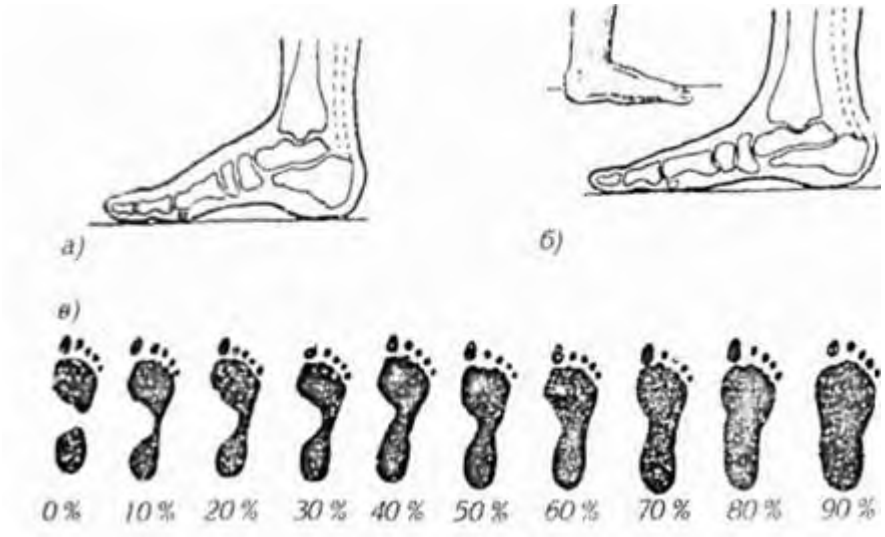
The static and dynamic function of the feet is of great importance in the development of posture in children. In its normal form, the foot stands on the outer longitudinal arch, and the inner arch becomes a spring that ensures elasticity of walking. If the muscles that support the arch of the foot become weak, the entire load falls on the ligaments, which, when stretched, flatten the foot.

Rickets, general weakness of the body and worsening of physical development, as well as excessive weight, which constantly puts excessive weight on the foot, contribute to the development of flat feet. Children's prolonged walking on hard ground /asphalt/ in soft shoes without heels has a harmful effect on foot formation. The easiest way to determine flat feet is to directly examine the lower surface of the foot or to examine the child's feet in a slightly spread position.

The most accurate way to determine the condition of the feet is the method of plantography – taking a footprint. To do this, a sponge moistened with any dye (methylene blue solution, potassium permanganate solution) is placed in the middle of a low box, and the top is covered with a thin cellophane film, under which a white sheet of paper is inserted over the sponge. The child is asked to stand on the box with his/her foot, pressing the film and the sheet of paper firmly against the soaked sponge with the sole of the foot. At the same time, the body weight is alternately transferred from one foot to the other. The plantogram shows the condition of the child's feet. A normal foot has well-defined arches on its inner and outer sides. The foot can be hollow (a), normal (b), flattened (c) and flat (d). Hollow foot develops often after polio and some diseases of the nervous system.

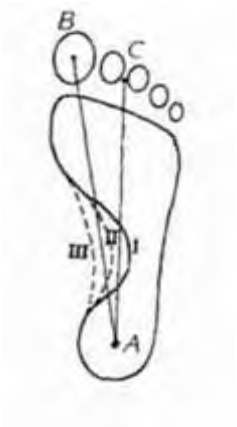


Rules for calculating the plantogram: measure the width of the widest and narrowest parts of both prints with a ruler, comparing these dimensions, and assess the condition of the arch of the feet. The foot is considered normal with a ratio of 1:3, 1:4, flattened with a ratio of 1:2 and flat with a ratio of 1:1.



Pic. 2. Foot shape: a – normal; b – flat; c – different degrees of flattening of the foot

The condition of the foot can also be assessed by obtaining a footprint on the floor or on paper (e.g., a wet foot on a piece of newspaper). Pic. 2 shows foot shapes with varying degrees of flattening. The presence of foot flattening can be objectively assessed by the plantographic method of V. Yaralov-Yaraland. To do this, two lines are drawn on the footprint (Pic. 27): AB, connecting the middle of the heel to the middle of the base of the big toe, and AC, connecting the middle of the heel to the second between the toes space. If the internal bend of the footprint contour does not reach the AC line, or only reaches it, a normal foot is stated (I); if the footprint contour is between the AB and AC lines, the foot is flattened (II), and if the footprint contour reaches only the AB line, the foot is flat (III).



Pic. 3. Assessment of the plantogram according to the method of V. Yaralov-Yaraland

Lecture 12-13: Additional examination of children's health status in the conditions of preschool education institution

Plan

1. Examination of children's compliance of biological age with passport age, the concept of the amount and reserve of health.
2. Determination of functional capabilities and physical performance of children's body.
3. Determination of body reactivity (degree of body resistance to adverse effects).
4. Determination of organism's resistance (organism's resistance to influence of negative factors).
5. Study of adaptive reactions of children's organism

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.
2. General theory of health and health protection: a collective monograph / edited by Prof. Y. D. Boychuk. Kharkiv: Rozhko S.G. Publishing House, 2017. 488 p.

1. It is well known that "age" is the period from the moment a person is born. Depending on the person's lifestyle, the passport age often does not correspond to the real age. Therefore, there are also such concepts as psychological and biological age. The most important and interesting thing is to study the correspondence of the passport age to the biological age during the period of the most intensive development of the child.

Passport age (chronological, calendar) is the period of time from the moment of birth to the present or any other moment of calculation.

Psychological age is determined by correlating the level of mental (intellectual and emotional) development of an individual with the corresponding normative level. It indicates a certain level of mental development, including - mental age - determined by the general intellectual indicator using the Wechsler test, which includes tasks in verbal and visual (figurative) form, for children from 4 years of age; - social maturity - determined by adaptation to the environment; - emotional maturity; - determined by the volatility of emotions, balance, personal maturity.

Biological age (anatomical and physiological) or developmental age is the correspondence of the biological state of an organism to the level of development, indicators of the main physiological systems and quantitative health characteristics that are most typical for determining the passport age. The biological age is determined by a combination of metabolic, structural, functional, regulatory features and adaptive capacities of the organism. It depends on heredity, environmental conditions and lifestyle and may not correspond to chronological age.

The term "biological age" first appeared in the scientific literature in the 30s and 40s of the twentieth century in the works of scientists V. Shtefko and D. Rokhlina. In her study, T. Krutsevych notes that determining biological age together with indicators of physical development allows for a more accurate assessment of the level of functional capabilities of children's body systems.

According to the degree of biological maturation, children of the same passport age can be divided into three groups:

- children whose biological age is less than the passport age;
- children whose biological age corresponds to the passport age;

- children whose biological age is ahead of their passport age.

A mismatch between the biological and calendar age of a child may indicate the presence of a pathology or unfavorable conditions for the development and functioning of body systems. A significant difference between biological and calendar age usually leads to a violation of the child's adaptation to the age-related requirements of the social environment.

To determine a child's biological age, the following characteristics are analyzed: development and disappearance of basic reflexes in infants; timing of eruption of milk teeth and their replacement with permanent teeth; body length; signs of puberty (school age). The most accurate characteristic of biological age is the degree of skeletal differentiation - ossification (bone age), which is determined by special tests. However, since it is carried out by X-ray, the use of this technique is limited due to the danger of excessive X-ray exposure. In addition to anatomical markers: assessment of somatoscopic, bone and sexual maturity of a child's body, physiological markers are also quite common: assessment of blood pressure, pulse, lung capacity and other indicators; indicators of physical and mental performance; indicators of bioelectrical activity of the brain (performed by a special device).

You can also determine the biological age of children using different methods. For example, according to the Morgan method, it is recommended to determine the age of children using somatoscopic indices, blood pressure, vision, and hearing; according to the Damon method, by hair condition, hand dynamometry, and anthropometry; according to the Webster method, by biochemical indicators: blood urea, plasma cholesterol, erythrocyte sedimentation rate, and physiological indicators: blood pressure and vital capacity of the lungs (VCL); according to Suominen's method, psychophysiological indicators are added to physiological indicators: symbolic-digital test; according to Nakamura's method - a combination of biochemical and physiological criteria, the body's response to maximum physical activity and recovery time; according to Voitenko's method, Voitenko-Tokar's method and other methods of domestic and foreign scientists. However, in most cases, these methods apply to school-age children.

Based on the above, the following basic criteria for biological age can be

identified, which are grouped by systems of features:

- indicators of morphological maturity - general somatic development; somatoscopic maturity; bone age; puberty;

- physiological and biochemical indicators - indicators of basic, carbohydrate and lipid metabolism; secretion of enzymes and hormones; features of the cardiovascular system; neurodynamic and neurophysiological characteristics;

- indicators of neuropsychological development.

It is worth noting that many researchers point to significant disparities between biological and passport ages. It is noted that biological age, to a greater extent than passport age, reflects the ontogenetic maturity of an individual, his or her ability to work and the nature of adaptive reactions. A large number of children have significant deviations from the average in terms of morphological and functional indicators. Moreover, within the same passport age, children differ in the level of biological maturity, in the level of exercise of physical qualities.

Determination of biological age in combination with indicators of physical development (according to the Ketle index by the formula: KI = BW / H, where KI is the Ketle Index, BW is body weight, and H is height) allows us to accurately assess the child's health level. Biological age can be determined by the following formula:

$$BA=HC/BL\times100,$$

where BA is biological age, HC is head circumference (cm), and BL is body length (cm).

The easiest way to determine the level of biological development of a child is to look at the indicators of the beginning of the change of milk teeth; the Philippine test. Baby teeth change – all stages of permanent teeth eruption are taken into account. Scoring of results: 1 point – if the change of milk teeth has begun at the time of the child's entry to school, 2 points – if it has not begun. Also, the level of biological development of a child can be determined using the Philippine test.

In addition to passport, psychological, and biological age, the scientific literature also includes the concept of "social age," which is measured by comparing the level of a child's social development (e.g., possession of a certain set of social roles) with what is normal for his or her age. That is, what place does the child occupy in a

particular group (family, preschool or school), what roles does he or she play, what responsibility is he or she able to take on, what benefits does he or she bring to others. Significant lagging or advancing of the social age from the passport age is associated with the social adaptation of the individual.

Since growth and development have individual characteristics, one or another phase of a child's biological, psychological, or social development may begin earlier or later than the average. There are children whose biological, psychological or social age is significantly ahead of their chronological (passport) age, or vice versa. For example, in adults, the difference between chronological and biological age can be up to 5 years.

In the late twentieth and early twenty-first centuries, there was a tendency to accelerate the pace of biological development of children and teenagers, as well as to increase the size of adults' bodies, which is called *acceleration*. It is manifested in earlier puberty and earlier reaching the age of school maturity (6 years on average). However, sometimes you can find children with a delay in physical development and the formation of the functioning of body systems, which is called *retardation*. The number of accelerated and retarded children in relation to the total number of children is approximately 13-20%. If the delay between the passport and biological ages does not exceed two years, and the weight of such children also corresponds to their biological age, parents of such children should not worry; later, both the growth and development of the body's systems will catch up with the passport age. It will be enough to adhere to a healthy lifestyle, that is, to eat rationally, engage in physical exercises, detect and treat chronic infections in time, which will allow the child's body to grow as much as it is laid down by heredity.

When analyzing the biological age of a child, it is worth mentioning the level of functional capabilities of the body - the amount of health. This indicator is determined by dividing the norm (N) corresponding to the age by the result (R) and multiplying by 100%.

According to the well-known cardiac surgeon N. Amosov (1913-2002), the amount of health is the sum of the "reserve capacities" of the main functional systems of the body, which can be determined by physical performance. To quantify the state

of health, it is necessary to assess its individual elements and identify the degree of interconnection between them. The amount of health is closely related to its reserve. In particular, M. Amosov proposed to define the concept of "amount of health" by the number of reserves of the body.

Comprehensively analyzing the interaction of a person with environmental factors, taking into account the type of his or her constitution, we can distinguish four main types of health reserves of each individual: biological, functional, mental, and social. Thus, *the biological reserve* of human health is the unrealized possibilities of a person's genotype, which are manifested as follows: - the way the genealogy is drawn up; - the study of certain genetic characteristics; - the analysis of reproductive function.

The functional reserve of a person's health is the degree of worn-out of the main homeostatic systems at each stage of ontogeny. This reserve for each functional system can be assessed with the help of dosed physical activity, and for a person as a whole – by the degree of compliance with his or her passport and biological health. A common sign of intensive consumption of a person's functional health is the degree of fatigue after performing a particular job.

Mental health reserve of an individual is the degree of compliance of character traits, temperament, talent of an individual, the profile of his/her socially useful work.

The social reserve of a person is understood as the level of his/her social recognition within the limits of underestimation or overestimation of his/her managerial, executive, organizational and other abilities.

A person's health reserves depend on his or her physical condition (ability to perform physical work) and lifestyle. And their formation and maintenance of a high functional state of the body's physiological systems is due to muscle work during physical exercises. And conversely, physical inactivity, poor nutrition, physical inactivity, neuropsychological overload and stress contribute to a decrease in reserves.

2. As noted above, the biological age of a child can be determined by examining, in particular, the functional capabilities of the child's body, and physical performance (general endurance) is an indicator of the amount of health and

physiological reserves of the body. To assess children's functional capacities and the level of their physical performance, one can use the most commonly used generally accepted physiological methods (according to L. Abrosimova, G. Apanasenko, E. Vilchkovsky, T. Krutsevich). One of the indicators of children's functional capabilities is the assessment of their functional state of the respiratory system, which is carried out by determining the vital capacity of the lungs (VCL) by spirometry. The data obtained are compared with the average values of the vital capacity of preschool children.

The functional state of the cardiovascular system of children is assessed using the pulsometry method. In addition, systolic pressure (maximum), diastolic pressure (minimum), and pulse pressure are also used to objectively assess the functional state of the cardiovascular system. The maximum blood pressure can be calculated by the formula:

$$MBP=100+A,$$

where A is the child's age in years (there may be fluctuations within ±15 mm Hg). The minimum pressure can be one third less than the maximum pressure; pulse pressure is determined by the difference between systolic and diastolic pressure. An increase or decrease in blood pressure above the accepted norms may indicate a variety of abnormalities or diseases. Thus, an increase in pressure may indicate borderline hypertension, nephritis, some heart defects, endocrine diseases, and a decrease in pressure may indicate chronic circulatory failure, acute vascular insufficiency, etc. Pressure fluctuations can occur due to deficiencies in the organization of the child's motor regime, lifestyle disorders, the effects of too much body weight, etc.

Robinson's index (heart rate index) - reflects the level of hemodynamic load on the cardiovascular system and characterizes the work of the heart muscle, is used to assess quantitatively the energy potential of the child's body, as well as an indicator of the reserve of the cardiovascular system (according to G. Apanasenko). It is measured by the formula:

$$DI=(HR\times SBP)/100,$$

where HR is the heart rate, SBP is systolic blood pressure, and DI is a dynamic

indicator (Robinson's index). The higher this indicator is at the height of physical activity, the greater the functional capacity of the heart muscle. It is also possible to measure this indicator at rest, so the lower the DI at rest, the higher the maximum aerobic capacity and the level of physical health of the child. The obtained indicators are compared with the average data: high - 74 and below, above average - 75-80, average - 81-90, low - 91 and above.

Pulse rate and pulse pressure can also indicate the level of general endurance (physical performance) of a child, which can be determined by the following formula:

$$EC = Px100/PP,$$

where EC is the endurance coefficient, P is the pulse, and PP is the pulse pressure. The data obtained are compared with the average indicators (Table 5, Appendix B). Rufier's test can also be used to determine physical work capacity (PWC170) of children.

Along with the above methods, functional tests that characterize the body's response to physical activity can also be used to assess the state of the child's body. One of these tests is the Martine-Kushelevsky method with a dosed load: 3-4 year olds do 10 sit-ups in 15 seconds, 5-6 year olds do 20 sit-ups in 30 seconds. A child wearing a blood pressure cuff and sitting on a chair for 1-1.5 minutes is measured for blood pressure and heart rate (HR) every 10 seconds for 1 minute. After that, she performs a dosed exercise (sit-ups) and sits down, and her pulse is measured again for the first 10 s, her blood pressure is measured, and the frequency and pattern of breathing is visually observed. Later, her pulse, blood pressure, and respiration are measured again to determine the time to return to the baseline values.

A good indicator is an increase in heart rate by 25-50 % relative to baseline data, and respiration - by 4-6 respiratory movements per minute, an increase in systolic pressure by 5-15 mm Hg, while diastolic pressure remains unchanged or decreases by 5-10 mm Hg. The return of all indicators to baseline values within 2-3 minutes should be considered a normal reaction of the child's body to the proposed physical activity, and after 3 minutes - a deviation from the norm. Deviation from normal reaction (norm) should be considered as follows: pulse rate increase by more than 50% and breathing (shortness of breath), increase in systolic pressure by more than 15 mm Hg

and diastolic pressure by more than 10 mm Hg. If pulse and pressure return to initial data after 2 minutes - 5 points, after 3 minutes - 4 points, 4 minutes and more - 2 points. You can also calculate the data using the formula:

$$TM\text{-}K = (〖Heart\ rate〗_{(a/s)} - 〖Heart\ rate〗_{(b/s)}) \times 100 / 〖Heart\ rate〗_{(a/s)},$$

where TM-K is the Martinet-Kushelevsky test, HRp/s is the heart rate after sit-ups, and HRb/s is the heart rate before sit-ups. If TM-K $\leq$ 25 - good state of CVS, 50-75 - satisfactory state of CVS, $\geq$ 75 - unsatisfactory state.

Orthostatic test is a pulse measurement with a change in body position. A child lying down for 2-3 minutes is counted several times for 15 seconds (multiplied by 4, the pulse for 1 minute is determined) until stable results are obtained. Then she slowly and calmly gets up and her pulse is counted again for the first 15 seconds of the second minute after getting up and also multiplied by 4. If the difference in the results is less than 12 beats per minute, the reaction is considered normal, and if it is 18 or more, it is unfavorable.

3. The human body is an integral biosocial system that is in unity with the environment, regulated by the central nervous system (CNS). In the course of physical development, hereditary and environmental factors constantly interact and determine the characteristics of the organism. According to the physiologists I. Sechenov (1829-1905) and I. Pavlov (1849-1936), the environment influences the development of the body's inborn features and regulates its functional capabilities. The interaction of hereditary and environmental factors determines the peculiarities of the body structure, higher nervous activity, and abilities of a child. An organism can exist and function successfully only when it is in balance with the environment, under the influence of which it has to change its physiological functions, i.e., to be reactive.

The body's reactivity is the ability of the body to change physiological functions under the influence of the environment. It depends on the state of the central nervous system (in particular, the state of the spinal cord, vegetative nervous system and psyche), endocrine system, connective tissue, environmental conditions (radiation, physical education, which increases the body's reactivity, nutrition) and is manifested

by protective reactions that counteract the harmful effects of the environment, help it to adapt to the environment as best as possible.

A child is born with certain innate abilities and capacities, and his or her full physical and mental development during the first six years requires targeted educational influence focused on the formation of a personality in the unity of physical and mental manifestations. The intensive growth and development of the preschool child's body and its inherent high reactivity require special professional skills from pedagogues. The high plasticity of the nervous system makes it possible to systematically influence the child's body, develop innate tendencies, and create the necessary conditions for the development of new qualities of the organism.

Despite the rapid growth and development, the organs and systems of a preschool child are still at the stage of formation and development, and the child's defences become stronger only with age. This requires constant attention to the timely development of the skeletal system and the entire musculoskeletal system, the formation of correct posture, as well as the correct development of the nervous and cardiovascular systems, and respiratory organs. Well-organised motor activity by a pedagogue is a prerequisite for improving the functions of all systems, because, as hygienist and pedagogue L. Chulytska (1870-1938) stated, movement is the foundation of a child's development.

In the late 60s of the last century, pathophysiologist M. Sirotinin (1896-1977) developed a classification of reactivity, and among the identified types, he attached particular importance to individual reactivity as being important in the fight against disease.

There are the following types of body reactivity:

- biological or species (aimed at preserving the biological species as a whole and an individual, it is inherited. In animals, it is manifested in the following ways: anabiosis, hibernation, seasonal migrations of birds and fish)
- group (formed on the basis of species; grouping into groups on a certain basis, for example, by type of labour activity - electricians are more adapted to the effects of current than people of other professions);
- individual (the resistance of each person is different: Some people may get

severely ill during epidemics, others may get lightly ill, and some may not get sick at all; it depends on age, gender, constitution, heredity, functional state of regulatory systems, and the environment; can be specific (immunity, tissue biological incompatibility reaction, hypersensitivity) and nonspecific (stress, change in the functional state of the nervous system, parabiosis, phagocytosis, biological barriers), which, in turn, are divided into physiological (specific - immunity, nonspecific – the body's reaction without disturbance of homeostasis) and pathological (specific – immunodeficiency, allergy; nonspecific - shock, collapse, coma, anaesthesia);

- physiological (changes in the body inherent in a particular age, gender);
- pathological (a decrease in the body's resistance or its increase, which is manifested, for example, by blood leukaemia or fever);

- age-related (has the following varieties: low reactivity of young children (due to imperfections in the systems that ensure it); high reactivity of mature people (increases with the beginning of puberty); low reactivity of the elderly (due to the exhaustion of protective forces));

- immunological (a combination of a number of interrelated phenomena, among which immunity is important).

In the postnatal period, reactivity, as well as resistance, changes throughout life. In children, reactivity is variable: some diseases are unique to children (rickets, rubella and other childhood infections), they are less adaptable to fluctuations in environmental temperature, intestinal diseases and dyspepsia are common, but in childhood, resistance to hypoxia is increased. People of mature age have the best reactivity and resistance, but in the elderly, resistance is reduced, which is manifested by a large number of different diseases (malignant diseases, atherosclerosis, prolonged inflammation, fever, hypersensitivity to purulent diseases, influenza, pneumonia).

The doctrine of reactivity was greatly influenced by the research of such scientists as: I. Mechnikov (1845-1916) (studied inflammation, immunity; phagocytosis), O. Bogomolets (1881-1946) (linked reactivity to the constitution of the body), M. Sirotynin (1896-1977) (linked reactivity to resistance). The mechanisms of changes in reactivity during aging were studied in detail by

academician, physiologist and gerontologist V. Frolkis (1924-1999).

The state of reactivity, as well as resistance, is determined by a sharp change in weather, season and climate. Reduced reactivity occurs with cooling, fatigue, poor nutrition, hypovitaminosis, and depends on gender, and is associated with anatomical and physiological differences. For example, in a woman's body, changes in reactivity are associated with the menstrual cycle, pregnancy, and menopause. In children, the state of reactivity is determined by the following factors: age, state of body systems, and environmental influences. Reactivity is assessed by number of acute respiratory infections per year, which depends on the child's existing immunity and living conditions. The body's reactivity is regulated, and this quality is used purposefully to increase the body's protective forces – resistance.

4. The organism's resistance is resistance to pathogenic factors or stimuli. It reflects the basic properties of a living organism and is interconnected with reactivity (M. Syrotinin). Resistance is considered a narrower concept than reactivity. Women's resistance to hypoxia, starvation, blood loss, and radial acceleration is higher than that of men.

In the late 60s of the last century, M. Syrotinin defined active and passive resistance, its primary and secondary forms: active – arises as a result of adaptation to a damaging factor, is carried out through protective, adaptive mechanisms; passive – due to the anatomical and physiological characteristics of the body – the structure of the skin, bone tissue and mucous membrane; primary – associated with heredity; secondary or acquired – during life. The acquired one, in its turn, is divided into active (increased resistance to hypoxia as a result of acclimatisation to high altitude or after vaccination) and passive (occurs during pyrotherapy). There is also nonspecific resistance, which is resistance to many factors due to the skin, mucous membranes, gastric juice, and blood components; specific resistance is resistance to the action of one agent. Phagocytosis is an important link in the body's nonspecific resistance, which ensures the development of preimmune and immune responses, eliminates immune complexes from the bloodstream, preventing immunocomplex diseases. In the course of phagocytosis, its performers implement a complex set of protective and adaptive mechanisms, which include not only cytotoxic or bactericidal

effects on the phagocytosis object, but also the secretion of inflammatory mediators (exocytosis), and activation of the phagocyte's energy metabolism. Cells with the ability to perform phagocytosis are called phagocytes.

A complex system of barriers that protect the body from adverse environmental influences plays an important role in the mechanisms of resistance, as well as reactivity, and the maintenance of homeostasis. There are external and internal barriers. External barriers include: skin, mucous membranes, gastric and intestinal juice, protective motor reflexes (coughing, sneezing, breath holding). Internal barriers include: liver, spleen, kidneys, placenta, lymph nodes and other organs containing cells of the mononuclear phagocyte system (PMS) (promonocytes, their precursors in the bone marrow, peripheral blood monocytes, tissue macrophages), as well as blood and tissues.

Starvation (partial, especially complete or chronic), severe physical fatigue, mental trauma, poisoning, colds, malnutrition, etc. contribute to a decrease in the body's resistance and can lead to illness. The following methods of increasing resistance are available: hardening, laughter therapy, self-regulation of the emotional state (relaxation of facial muscles, breathing, visualisation), motivational self-regulation, hypoxic training (swimming, training in mountain air), therapeutic exercises, reflexology, climatotherapy (aerotherapy (breathing air through walks, air baths, climate pavilions, sleeping by the sea), heliotherapy (solar energy), thalassotherapy (bathing in the sea or other bodies of water)), balneotherapy, rational nutrition, phytotherapy, use of phytoncides, apitherapy, hirudotherapy, autohemotherapy.

To determine resistance (the level of resistance) in children, the number and duration of acute respiratory illnesses (ARI) and exacerbations of chronic illnesses during the year are analysed. According to the recommendations of the Ministry of Health of Ukraine, an indicator of high resistance is the absence of ARI during the year, medium resistance - single diseases (up to 3), low resistance - from 4 to 7 times, very low resistance - 7 or more. If the observation lasted less than a year, resistance is assessed by the index of acute respiratory illness frequency, which is the ratio of the number of acute illnesses experienced by the child to the number of months of

observation. Resistance scores: good - up to 3 (acute illness frequency index - resistance index - up to 0.32); reduced - from 4 to 5 (acute illness frequency index - IR - 0.33-0.49); low - from 6 to 7 (acute illness frequency index - IR - 0.50-0.66); very low - 8 and more (acute illness frequency index - IR - 0.67 and more).

The following formula can also be used:

$$I = \frac{N}{t},$$

where N is the number of ARI, t is the child's age. A child is considered frequently ill if the index is greater than 0.33.

5. In addition to the above, the state of health of children should also be considered in the context of the body's adaptation processes. According to educators and psychologists (O. Zaporozhets, V. Mukhina, etc.), the determining factor in the development of a child's personality is his or her emotional well-being in the family, preschool or school. In studies (D. Andreeva, B. Parigina, etc.), adaptation is defined as a part of long-term socialisation of a personality to the conditions of the surrounding social environment. Psychophysiological aspects of adaptation have been studied by P. Anokhin, T. Kaznacheiev, V. Lopukhova and others, psychological and pedagogical aspects of adaptation of children of early and junior preschool age to the conditions of PEI were considered by R. Tonkova-Yampolska, N. Vatutina, J. Yuzvak, for the first time the problems of adaptation of preschool children were studied by E. Krychevska, also studied by O. Kononko, S. Meshcheryakova, psychological readiness of children for school, peculiarities of their adaptation to learning were studied by L. Bozhovych, L. Wenger, O. Proskura, etc.

Adaptation is an organism's adjustment at the physiological, social and psychological levels. There are two types of adaptation: physiological and social. Physiological adaptation is the reaction of the body's functional systems to a particular situation. Social adaptation is the process of adapting a person to social conditions.

Depending on the peculiarities of the adaptation process, the following degrees of adaptation are distinguished (according to R. Tonkova-Yampolskaya)

- mild – the child's behaviour, sleep and appetite return to normal within 10-15

days;

- medium – lasts for 15-30 days, up to 40 days – the child loses weight, can easily get sick without complications; sleep, appetite and behaviour are normalised by the end of the period;

- severe – lasts from 2 months and more – pathological adaptation, immunity is reduced, the child is constantly and prolonged ill, one disease is replaced by another, behaviour deteriorates, sleep and appetite are disturbed, and the child does not play with children.

The speed of children's adaptation to the conditions of preschool educational institutions varies and depends on the following factors: - age; - type of higher nervous activity; - health status; - sociability; - socialisation; - style of upbringing in the family; - family relationships; - availability of play and other skills; - emotional dependence on the mother.

The process of adaptation includes a sequential change of adaptation, compensation and disruption. Depending on the impact of adaptation on the functional state of the body, academician R. Baevsky (1928-2020) proposed the following classification:

- a state of satisfactory adaptation to environmental conditions, the body's functional capabilities are not reduced, and there are no clinical manifestations;
- a state of tension of adaptive mechanisms, the functional capabilities of the body are also not reduced, there are no clinical manifestations;
- a state of unsatisfactory adaptation to environmental conditions, the functional capabilities of the body are reduced, there are no clinical manifestations, well-being is achieved by excessive tension of functional systems (is a pre-disease state – "pre-disease");
- failure of adaptation mechanisms, sharp decline in functional capabilities of the child's body.

Adaptation depends on: - the strength of environmental factors; - the individual reactivity of the organism.

Individual adaptation to new conditions of existence occurs due to:

- changes in metabolism - metabolism;

- maintaining homeostasis, i.e. the constancy of the internal environment of the body;
- immunity, i.e. the body's immunity to various agents and substances, both infectious and non-infectious, that enter the body or are formed in it for various reasons;
- regeneration, i.e. restoration of the structure of damaged organs or tissues of the body - wound healing, etc;
- adaptive unconditional and conditioned reflex reactions - adaptive behaviour.

The criterion for the degree of adaptation is the maintenance of homeostasis regardless of the duration of the factor to which the adaptation was formed. In the conditions of a disease, compensation occurs - the body's struggle for homeostasis through additional defence mechanisms that counteract the onset and progression of the pathological process. If a signal of great danger is received and the mechanisms activated are not enough, stress diseases occur. One of the most studied adaptation reactions is stress.

Canadian pathologist and endocrinologist of Austro-Hungarian origin G. Selye (1907-1982), studying stress as a nonspecific reaction of the body to the action of any stimulus (stressor), developed its concept, according to which the hypothalamic-pituitary-adrenal system (HPAS) plays a leading role in the body's nonspecific resistance. According to the researcher, this system carries out the general adaptation syndrome (GAS), a set of nonspecific adaptive reactions of the body to the action of a stressor, which occurs in three stages – mobilisation or anxiety reaction (with shock/anti-shock phases) – immediate mobilisation of the body's defence forces due to HPAS stimulation; - resistance stage – hypertrophy of the adrenal cortex and large amounts of hormones are released; - exhaustion stage – increased secretion of corticoliberin, corticosteroids, etc. Under conditions of prolonged exposure to a strong stressor, resistance is not maintained, adaptation is lost, and exhaustion occurs.

Depending on the strength and duration of the stressor, two types of stress are distinguished: distress (negative, long-term, disrupting adaptation mechanisms and exhausting the body's defences) and eustress (positive, short-lived, activating the

body's capabilities and reserves).

Numerous scientific and experimental studies have shown the negative impact of stress factors on a child's mental and physical health. Neurotic behavioural manifestations appear in children as a result of a lack of communication with adults, growing up in conditions of family problems and hostile attitudes of adults. In addition, children's bodies are negatively affected by information from television and the Internet. A mentally healthy child is characterised by harmonious development, spirituality, balance and adaptability. Harmonious personal development and physical health contribute to the successful adaptation of a child in society, which is very important when attending preschool educational institution.

There are the following ways to increase adaptive capacity: - rational nutrition; - optimal alternation of sleep and wakefulness; - physical activity; - hardening.

The following formula is used to determine the level of a child's adaptive potential (AP), which characterises the body's adaptive capacities to environmental changes and health status:

AP □ 0.011 x HR □ 0.014 x SBP □ 0.008 x DBP + 0.014 x A □ 0.009 x BW □ 0.009 x BL □ 0.27,

where HR is heart rate; SBP is systolic (upper) and DBP is diastolic (lower) blood pressure (in mm Hg); A is age; BW is body weight; and BL is body length (height). Scale for assessing changes and interpretation of adaptive potential (in points), adapted for childhood: - satisfactory, if the AP is up to 1.89; - stressed, if the AP is from 1.9 to 2.14; - unsatisfactory with the AP from 2.15 to 2.41; - overstrain and failure of adaptation with the AP above 2.41.

Lecture 14-15: Control over the physical development of preschool children

Plan

1. Methods of determining the level of development of motor (physical) qualities of children.
2. Assessment of children's motor fitness.
3. Control over physical culture classes.

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

2. Diagnostic methods for assessing the physical condition of preschool children and preventive exercises to improve it: a textbook. 2nd edition, supplemented / authors-compilers E.S. Vilchkovskyi, O.I. Kurok, N.O. Khlus. Vinnytsia: Tvory LLC, 2023. 63 p.

1. One of the indicators of the body's functional capabilities is the development of physical (motor) qualities in preschool children: speed, agility, flexibility, strength and endurance. It occurs both during their natural growth and during specially organised physical activity (during walks and physical education classes, morning and afternoon gymnastics, outdoor and sports games, sports exercises, independent motor activity, etc.)

Speed. Speed is understood as a person's ability to perform various actions (physical exercises, labour operations) in the minimum period of time for the relevant conditions. The level of development of this quality is determined by the state of the motor apparatus (the degree of development of the muscular system); the state of the central nervous system (mobility, strength and balance of excitation and inhibition processes). Speed is a complex motor quality that manifests itself in various forms, including: latent time of motor reaction; the fastest possible performance of one movement (with low external resistance); time of movement performance with maximum frequency; time of performance of a complete motor act. In the practice of physical education of preschoolers, the speed of performing various physical exercises is of the greatest importance: running, walking, jumping, throwing a ball, climbing.

Methods for determining speed

A method for determining the speed of hand movements. By analysing the speed of movements in one part of the child's motor apparatus, it is possible to draw conclusions about the ability to perform movements at maximum speed in other parts of the apparatus. The frequency of hand movements in 5 seconds is checked with a

stopwatch: a sheet of white paper is placed on the table in front of the child, and a sharpened simple pencil is given in the hand. On the command "Go!", he or she randomly begins to put dots on the sheet of paper at maximum speed, and on the command "Stop!" stops moving. The test is repeated three times, and the best result is recorded and compared with the average (Table 1).

Table 1

Average indicators of hand frequency movements

Age	Gender	Average movement frequency per 5 sec		
		High level	Intermediate level	Low level
		Points: 5	3	2
1	2	3	4	5
3 years	Boys	20	19-13	12
	Girls	20	19-15	14
3y. 6m.	Boys	21	20-14	13
	Girls	21	20-16	15
4 years	Boys	22	21-15	14
	Girls	23	22-17	15
4y. 6m.	Boys	23	22-16	15
	Girls	24	23-18	17
5 years	Boys	25	24-21	20
	Girls.	26	25-21	20
5y. 6m.	Boys	26	25-22	21
	Girls	27	26-22	21
6 years	Boys	28	27-23	22
	Girls	29	28-23	22
6y. 6m.	Boys	29	28-24	23
	Girls	30	29-25	24

Jumping on the spot. A child performs jumps on the spot in the middle of a drawn circle or hoop with a push of both feet for 5 s (according to a stopwatch) from a closed stance – heels and toes together, hands on the waist. A sheet of thick paper is

held at a distance of 5-8 cm from her head. On the signal "Go!" the child jumps on the spot, pushing off with both feet with maximum speed, touching the sheet of paper with his/her head. On the command "Stop!" the movement stops after 5 seconds. Three attempts are made, the best result is recorded and compared with the average (Table 2).

Table 2

Average indicators of jumping on the spot in preschoolers

Age	Gender	Average indicators of jumps on the spot (for 5 sec)		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	10	9-6	5
	Girls	9	8-6	5
3y. 6m.	Boys	11	10-8	7
	Girls	11	10-8	7
4 years	Boys	12	11-9	8
	Girls	12	11-9	8
4y. 6m.	Boys	13	12-10	9
	Girls	13	12-10	9
5 years	Boys	15	14-11	10
	Girls	14	13-11	10
5y. 6m.	Boys	16	15-12	11
	Girls	16	15-13	12
6 years	Boys	17	16-13	12
	Girls	18	17-15	14
6y. 6m.	Boys	19	18-16	15
	Girls	20	19-16	15

30 m run (for children aged 6 years). The test is conducted according to the traditional method, one attempt is made, and the result is the time to cover the distance with an accuracy of 0.1 sec. The result is compared with average indicators (Table 3).

Table 3

Tests and standards for assessing the physical (motor) qualities of 6-year-old children

Types of tests	**Gender**	**Standards, points**				
		5	**4**	**3**	**2**	**1**
Endurance. Run for 600 m, min.	Boys	2.50	3.05	3.20	3.25	3.50
	Girls	3.15	3.30	3.45	4.05	4.50
Strength. 1. Flexion and extension of arms in a support, lying on the floor (times) *or*	Boys	14	11	7	4	1
	Girls	8	6	5	3	1
- pull-ups on the bar (times) *or*	Boys	3	2	1½	1	1/2
	Girls	2	1	¾	½	1/3
- hanging on bent arms (sec.)	Boys	8	6	4	3	1
	Girls	6	5	3	2	1
1. Rise to the sit in 1 minute (times).	Boys	26	22	18	14	10
	Girls	26	22	18	14	10
2. Long jumps from a place (cm) *or*	Boys	130	117	105	93	80
	Girls	120	100	90	90	80
- Jumping up (cm)	Boys	27	24	20	17	13
	Girls	25	22	18	15	11
Speed. Running for 30 m (sec.)	Boys	5,9	6,5	7,1	7,6	8,2
	Girls	6,3	6,9	7,5	8,0	8,6
Agility. Shuttle race 4x9 m	Boys	12,3	13,0	13,8	14,5	15,2
	Girls	12,5	13,2	14,0	14,7	15,4
Flexibility.	Boys	8	5	3	1	0

Leaning the body forward from a sitting position (cm)	Girls	10	7	4	2	0

Agility. Agility is the ability of a person to perform movements accurately in difficult coordination conditions. The criteria for assessing agility are: coordinational complexity of motor actions; accuracy of movements (in spatial, time and strength characteristics). It has been revealed that the better agility is developed in children, the easier and faster they develop motor skills. The physiological mechanisms that are the basis for the development and manifestation of agility depend on the mobility of nervous processes; coordination abilities of the central nervous system, its plasticity. The central nervous system, through the creation of new temporary connections, ensures the formation of complex coordinational movements and their rapid switching.

Methods for determining agility

A method of determining the accuracy of hitting an object on target. The child throws tennis balls (for playing tennis) or small rubber balls into circles drawn on the wall or a board attached to a stand or wall, 10 cm apart, i.e. each circle is 10 cm wide and the radius of the central circle is 10 cm. Each child throws three times with a hand that is comfortable for him/her. For hitting the central circle, 5 points are awarded, for hitting the next line – 4 points, for the one following the circle – 3 points, etc. For a throw when the ball does not hit the circle – 0 points. The ball is thrown at the target from a distance: children 3-3,6 years old – 2 m; 4-4,6 years old – 2,5 m; 5-5,6 years old – 3 m; 6-6,6 years old – 3,5 m. The scores are summed up and compared with the average (Table 4).

Table 4

Average indicators of throwing a ball at a target in preschoolers, points

Age	Gender	Average indicators of throwing the ball into the target		
		High level	Intermediate level	Low level

		Points 5	3	2
3 years	Boys	7	6-4	3
	Girls	6	5-3	2
3 y. 6 m.	Boys	8	7-5	4
	Girls	7	6-4	3
4 years	Boys	8	8-6	5
	Girls	9	7-5	4
4 y. 6 m.	Boys	10	9-6	5
	Girls	9	8-5	4
5 years	Boys	11	10-7	6
	Girls	10	9-6	5
5 y. 6 m.	Boys	12	11-8	7
	Girls	11	10-7	6
6 years	Boys	13	12-9	8
	Girls	12	11-8	7
6 y. 6 m.	Boys	14	13-10	9
	Girls	13	12-9	8

Method of determining jumps with a turn (in degrees). The child stands on a sheet of thick paper attached to the floor, on which there is a graduation (facing the zero mark) in the starting position - a closed stance, hands on the waist. He/she begins to perform three jumps alternately to the maximum angle to the left and then to the right, while landing steadily, without losing balance. Evaluating the results, we calculate the angle in degrees at which the child turned (the best of the three attempts is recorded). To determine the scores, the results are compared with the average values shown in Table 5.

Table 5

Average indicators of jumps with a turn in preschoolers

Age	Gender	Average indicators of jumps with a turn, degrees					
		Levels: high	average	low	high	average	low

		Points: 5	3	2	5	3	2
3 years	Boys	175	174-140	139	165	164-130	129
	Girls	165	174-130	129	160	159-130	129
3 y. 6 m.	Boys	185	184-145	144	185	184-140	139
	Girls	180	179-140	139	180	179-135	134
4 years	Boys	195	194-150	149	195	194-145	144
	Girls	200	199-155	154	195	194-140	139
4 y. 6 m.	Boys	210	209-155	154	215	214-150	149
	Girls	215	214-160	159	205	204-145	144
5 years	Boys	225	224-160	159	230	229-160	159
	Girls	230	229-165	164	215	214-155	154
5 y. 6 m.	Boys	235	234-170	169	235	234-165	164
	Girls	240	239-175	174	225	224-170	169
6 years	Boys	245	244-180	179	245	244-180	179
	Girls	250	249-190	189	250	249-185	184
6 y. 6 m.	Boys	260	259-195	194	265	264-200	199
	Girls	265	264-200	199	270	269-210	209

The method of determination of jumps for accuracy. A child performs a deep jump from a height of 20 cm (gymnastic bench or cube) from a starting position: legs half-bent, hands on the waist, with landing in a designated place – on three ribbons of different colours laid on the floor parallel to each other at a distance from the bench of 30-45-50 cm – for children 3-3,6 years old; 30-40-60 – for children 4-4,6 years old; 40-55-70 cm – for children 5-5,6 years old; 45-60-80 cm – for children 6-6,6 years old. The child should land with both feet (step) first on the tape farthest from the bench, then on the near and middle ones; if he/she steps on all three tapes (in three attempts), he/she gets 5 points, on two – 3 points, on one – 2 points; if he/she does not step on any tape – 0.

Shuttle race 4x9 m (sec) (for children of 6 years old). It is carried out on a flat running track of 9 m length, bounded at the start and finish by two parallel lines, two semicircles of 50 cm radius are drawn behind the lines, the centre of which is on the lines, two cubes are placed in the circle at the finish. On the command "On the start!"

the child takes a high start position, on the command "Run!" runs 9 m to the second line, takes one of the two cubes from the semicircle, returns running back and places it (no throwing, otherwise the attempt will not be counted) in the starting semicircle. The time is recorded from the beginning of the run to the moment when the child places the second cube in the starting semicircle. Children make two attempts, the best result is recorded and compared with the average (Table 3).

Flexibility. This motor quality characterises the degree of mobility in different parts of the human musculoskeletal system and depends on the shape of the joints, elasticity of muscles and ligaments, the motor apparatus, and the functional state of the central nervous system. An indicator of flexibility is the maximum amplitude of movements, which is measured in linear and angular units.

Methods for determining flexibility

Torso tilt downwards. The child, standing on a bench (height 20 cm) and without bending the legs at the knees, performs a forward tilt of the torso from a closed stance (heels and toes together) as far as possible, touching the ruler with the fingers of both hands. The ruler scale is graduated as follows: "0" should correspond to the surface of the bench, and centimetres with a "-" sign go above the surface of the bench, and centimetres with a "+" sign go below. The estimated depth of inclination is determined in centimetres. The child performs three attempts, the best result is compared to the average (Table 6). Children should be supported from behind by holding their shirt.

Table 6

Average indicators of forward body tilt in preschoolers, sm

Age	Gender	Average indicators of forward body tilt		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	7	6-2	1
	Girls	9	8-3	2
3 y. 6 m.	Boys	7	6-2	1

	Girls	9	8-3	2
4 years	Boys	8	7-3	2
	Girls.	10	9-4	3
4 y. 6 m.	Boys	8	7-3	2
	Girls	10	9-4	3
5 years	Boys	9	8-4	3
	Girls	11	10-5	4
5 y. 6 m.	Boys	9	8-4	3
	Girls	11	10-5	4
6 years	Boys	10	9-5	4
	Girls	12	11-6	5
6 y. 6 m.	Boys	10	9-5	4
	Girls	12	11-6	5

Forward torso bend from a sitting position (cm) (for children aged 6 years). The test is performed on the floor with a starting line marked from 0 to 50 cm. The child sits barefoot so that his/her heels (20-30 cm apart) touch the starting line, hands between the knees, palms down, and an assistant holds the legs in the knees to avoid bending them. On the command "You can!" the child gently bends forward and, without bending the legs, tries to touch with the fingers as far as possible with fixing the position for 2 s. The child performs two attempts, the best one is recorded and compared with the average (Table 3).

Endurance. This is the ability of a person to perform motor activity (exercise, work) for a long time at a certain level of intensity. Endurance is provided by the increased capabilities of the body's functional systems. Depending on the size of the muscle groups involved, general and special endurance are distinguished; preschoolers mainly develop general endurance. There are static and dynamic endurance.

Methods for determining endurance

A method for determining statistical endurance. The child performs a hang on the bar, the height of which is adjustable. At the beginning of the test, the child stands on a stand or bench (if necessary), grasps the bar from above and, taking the hang

position, hangs as long as he or she can. After completing the test, she jumps onto the gymnastic mat. The time of holding the hang is recorded with a stopwatch to the nearest 1 second. The child performs two attempts with a break of 1.5-2 minutes between them for rest. The best result is recorded, the data are compared with average indicators (Table 7).

Table 7

Average indicators of static endurance in preschoolers, sec

Age	Gender	Average indicators of static endurance		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	20	19-12	11
	Girls	18	17-10	9
3 y. 6 m.	Boys	24	23-14	13
	Girls	20	19-12	11
4 years	Boys	28	27-16	15
	Girls	24	23-14	13
4 y. 6 m.	Boys	32	31-18	17
	Girls	28	27-16	15
5 years	Boys	36	35-22	21
	Girls	32	31-20	19
5 y. 6 m.	Boys	40	39-24	23
	Girls	34	33-22	21
6 years	Boys	44	43-28	27
	Girls	36	35-24	23
6 y. 6 m.	Boys	50	49-32	31
	Girls	40	39-26	25

Method of determining dynamic endurance. A child runs at 60 % of his/her maximum speed in a circle on a sports ground or stadium, where the distance is measured in metres. The child runs as long as he/she can. The distance (in metres) that the child can run before stopping is recorded and compared to the average (Table

8).

Table 8

Average indicators of preschool children running with average speed, m

Age	Gender	Average indicators of running		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	280	279-230	229
	Girls	265	264-220	219
3 y. 6 m.	Boys	380	379-350	349
	Girls	345	344-310	309
4 years	Boys	485	384-445	444
	Girls	400	399-360	359
4 y. 6 m.	Boys	560	559-530	529
	Girls	450	449-395	394
5 years	Boys	635	634-570	569
	Girls	490	489-435	434
5 y. 6 m.	Boys	665	664-620	619
	Girls	535	534-490	489
6 years	Boys	715	714-660	659
	Girls	685	684-640	639
6 y. 6 m.	Boys	815	814-750	749
	Girls	725	724-670	669

Running for 600 m, min/ sec (for children 6 years old). It is conducted according to the traditional method. Children start from a high start on a flat run track. The time of covering the distance is recorded by a stopwatch with an accuracy of 1 second. The results are compared with the average (Table 3).

Strength. This quality is the result of the functional characteristics of the neuromuscular system responding to the influence of the environment. The optimal development of muscle strength is a necessary component of children's physical development, stimulating the functions of many organs and systems, and helping to

develop motor skills and correct posture. Methods for determining strength are optional.

Methods of force determination

The dynamometry method allows to determine the strength of the hands, which is measured using a children's hand dynamometer, located in the child's hand with the arrow pointing to the palm. The child alternately squeezes the dynamometer three times with each hand extended to the side, without touching the body or any objects, without unnecessary sudden movements. The best result of the right and left hands is recorded and compared with the average indicators (Table 9).

Table 9

Average indicators of hand dynamometry in preschoolers, kg

Age	Gender	Average indicators of hand dynamometry, kg					
		Right hand			Left hand		
		Levels: High Points: 5	Average 3	Low 2	High 5	Average 3	Low 2
3 years	Boys	6,5	5,0-6,4	4,9	6,0	4,0-5,9	3,9
	Girls	6,0	4,5-5,9	4,4	5,5	3,0-5,4	2,9
3 y. 6 m.	Boys	7,5	5,5-7,4	5,4	6,5	4,4-6,4	4,3
	Girls	7,5	5,0-7,4	4,9	6,5	3,5-6,4	3,4
4 years	Boys	8,5	6,0-8,4	5,9	7,5	5,0-7,4	4,9
	Girls	8,0	5,5-7,9	5,4	7,0	4,0-6,9	3,9
4 y. 6 m.	Boys	9,0	6,5-8,9	6,4	8,5	5,5-8,4	5,4
	Girls	8,5	6,0-8,4	5,9	8,0	4,5-7,9	4,4
5 years	Boys	10,5	7,0-10,4	6,9	9,5	6,5-9,4	6,4
	Girls	9,5	6,5-9,4	6,4	9,0	5,5-8,9	5,4
5 y. 6 m.	Boys	11,5	8,0-11,4	7,9	10,5	7,5-10,4	7,4
	Girls	10,5	7,5-10,4	7,4	9,5	6,0-9,4	5,9
6 years	Boys	12,5	9,0-12,4	8,9	11,0	8,5-10,9	8,4

	Girls	12,0	8,0-11,9	7,9	10,5	7,0-10,4	6,9
6 y. 6 m.	Boys	14,0	10,0-13,9	9,9	12,5	9,0-12,4	8,9
	Girls	13,0	9,0-12,9	8,9	11,5	8,0-11,4	7,9

Long jump from a spot. It is carried out according to the traditional method. The result of the test is the jump distance (in cm). The child performs two attempts, the best result is recorded and compared with the average (Table 3).

High jump from the spot (for children 6 years old). The child's fingers are covered with chalk and he/she faces the wall with markings (in cm). On the command "You can!" the preschooler raises his hands up and touches the wall with the markings, leaving a print. After that, he/she lowers his/her hands, slightly crouches down and jumps up, pushing off with his/her feet, trying to touch the markings with the fingertips of both hands as high as possible. The result of the test is the distance between the initial mark with the hands and the final mark. Two attempts are made, the best result is recorded and compared to the average (Table 3).

Flexion and extension of the arms in a support lying on the floor (for children aged 6 years). The child is lying in a support, arms straight shoulder-width apart with hands forward, torso and legs straight, on the command "You can!" bends and extends arms, touching the support with the chest. One attempt is performed. It is not allowed to change the position, lie down with the legs on the floor, stop in the position for more than 3 seconds, bend the arms alternately or not with full amplitude. The results are compared with the average (Table 3).

Pull-ups on the bar (for children 6 years old). It is carried out on a bar with a diameter of up to 2 cm, its height is such that children do not touch the floor with their feet. A child grips the bar with a top grip from a bench or cube, shoulder-width apart, arms straight. On the command "You can!", bending the arms from the hanging position, he/she pulls up to the bar, chin above it and returns to the hanging position. One attempt is performed, but as many times as he/she can. If the child has completed a half pull-up, in which the angle of bending of the arms at the elbows is clearly visible, he/she is scored 1/3 of the pull-up; if he/she has pulled up to the position where his/her head touches the bar with the tip of the nose, he/she is scored ¾ of the pull-up. During the exercise, you should not sway, stop for a long time, or make

unnecessary leg movements. The results are compared with the average (Table 3).

Hanging on bent arms (for children 6 years old). It is carried out on a bar with a diameter of 1,5-2 cm at such a height that children do not touch the floor with their feet. A child from the bench takes the starting position of a hanging lunge on the bar on bent legs, with the chin above the bar. After taking the starting position, the command "You can!" is given, the child stops leaning on his/her legs and hangs on bent arms, chin in the same position. The time (in seconds) during which the child maintained the hanging position on bent arms is recorded. Testing is stopped if the position of the arms, chin or legs changes. The results are compared with the average values (Table 3).

Rising to the sitting position in 1 min (for children aged 6 years). The child lies back on a flat surface on the mat, legs bent at the knees at a right angle, distance between the feet 30 cm, fingers joined behind the head. The assistant holds the child's feet, who, after the command "You can!", moves to a sitting position, touching the knees with his elbows, then takes the starting position again. The exercise is performed without stopping, without helping oneself with the elbows, for one minute with maximum frequency, and the number of times is counted. The results are compared with the average (Table 3).

The strength of a person's muscles is revealed under conditions of the greatest volitional tension and can be an indicator of the functional state of the central nervous system. There are three ways to determine *muscle strength* (dynamometry): measuring hand strength, postural strength (back muscle strength) and abdominal strength. To determine *hand strength* (arm strength), a hand dynamometer is used, which consists of an oval steel spring with a scale inside it with divisions on the scale and an arrow showing muscle strength in kilograms. Arm strength is measured in the following way: the dynamometer is taken in the hand, stretched to the side, and squeezed as hard as possible. The test is repeated 3 times for each arm separately, and the best result is recorded.

Arm strength depends on height, body weight, chest circumference, etc. Since body weight can change, it is also worth determining the indicator of hand grip strength - the relative strength of the hand. To do this, multiply the number that

shows the hand grip strength of the stronger hand multiply by 100 and divide the resulting number by body weight. These data are compared with the average values (Table 10).

Table 10

Muscle strength of children's finger flexors according to dynamometry data

Age (years)	Muscle strength of the flexors of the fingers (kg)			
	Right hand		Left hand	
	Boys	Girls	Boys	Girls
6	9,2	8,4	8,5	7,7
7	10,7	9,9	10,1	9,2

Postural strength, or the strength of the back extensor muscles, is determined using a state dynamometer. The examinee stands with his feet on a wooden platform with a dynamometer attached to it with a hook, which should be at knee level. Bending at the waist, the examinee takes the handle of the state dynamometer with both hands and, without bending the knees, straightens the back, squeezing it until it fails. The test is performed twice, and the best result is recorded to the nearest 5 kg. When measuring postural strength, it should be considered that it requires extreme effort, so it is not performed with preschool children.

Strength of the abdominal muscles. Abdominal muscles are a group of abdominal muscles that form the anterior wall of the abdominal cavity (four paired muscles: rectus abdominis, external oblique muscle, internal oblique muscle, transverse abdominal muscle). The degree of abdominal development is determined by special functional tests. The most accessible method is the following: the child lies down on a couch, bench or floor with arms stretched along the body, then from this position he or she should move to a sitting position without bending the legs or lifting them off the floor, and then lower again. Children with underdeveloped abdominal muscles cannot lift themselves up without the help of their arms or lift their legs high. This exercise is performed with school-age children.

2. Improvement of the system of physical education of preschool children can be carried out only on the basis of in-depth study of the peculiarities of the development of their motor fitness in all age groups. Formation of preschooler's motor skills depends on three main factors: genetically determined motor abilities; voluntary motor activity of a child, which is associated with performing many movements in everyday life, and a specially organised system of physical education (in preschool and family), which stimulates the ontogenetic development of a child's motor skills.

The plasticity that is inherent in the body of a preschool child causes a relatively rapid pace of morphological and functional changes. Maturation of the central nervous system and musculoskeletal system of a child creates necessary prerequisites for preschoolers to master various motor actions: walking, running, jumping, throwing, etc. Therefore, the use of various means and methods of physical education in this age period has a positive effect on the development of a child's motor fitness.

The motor fitness of a preschooler is assessed by comparing his/her individual (qualitative and quantitative) indicators in performing basic movements with the average age norms (standards), which are given in the relevant tables. The child's motor fitness is assessed by the following tests: 10 m walking, 10 and 20 m running, long jump from a standing position, long and high jumps from the run (older groups), throwing a stuffed ball (weight 1 kg) with both hands from behind the head at a distance, throwing small or tennis balls (weight 40 g) at a distance. Each of these tests is evaluated in points (5, 3, 2). After the examination, the points received by the child are summed up and divided by the number of tests performed. If a child receives a score in the range of 4 to 5 points, his/her motor fitness is good, from 3 to 4 points – satisfactory and below 3 points – insufficient (unsatisfactory). For a more comprehensive assessment of a child's motor fitness, it is advisable to also take into account the quality of the above mentioned motor actions, comparing it with the criteria for the technique of basic movements in different age groups.

1. Walking. Examination of walking development level is carried out at a distance of 10 m (time is measured by a stopwatch with an accuracy of 0.1 sec). Start and finish are marked by lines. Each child walks at an average pace twice, the best

result is recorded in the protocol. The time is counted from the moment when the child starts walking. The stopwatch is stopped when the child crosses the finish line (Table 11).

Table 11

Average walking performance at a distance of 10 m, sec

Age	Gender	Walking for a distance of 10 m		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	7,9	8,0-8,6	8,7
	Girls	8,2	8,3-8,8	8,9
3 y. 6 m.	Boys	7,7	7,8-8,2	8,3
	Girls	8,0	8,1-8,4	8,5
4 years	Boys	7,4	7,5-7,8	7,9
	Girls	7,7	7,8-8,1	8,2
4 y. 6 m.	Boys	7,1	7,2-7,5	7,6
	Girls	7,3	7,4-7,8	7,9
5 years	Boys	6,8	6,9-7,2	7,3
	Girls	7,1	7,2-7,5	7,6
5 y. 6 m.	Boys	6,4	6,5-6,9	7,0
	Girls	6,7	6,8-7,2	7,3
6 years	Boys	6,2	6,3-6,7	6,8
	Girls	6,3	6,4-6,9	7,0
6 y. 6 m.	Boys	5,9	6,0-6,3	6,4
	Girls	6,0	6,1-6,4	6,5

Qualitative indicators of walking.

Younger age.

1. Straight, not tense position of a trunk and head.
2. Free movements of hands (still non-rhythmic and non-energetic).
3. Coordinated movements of the arms and legs.

4. Approximate adherence to the direction of movement while walking.

Middle age.

1. Straight, unstrained position of the torso and head.
2. Free movements of the arms.
3. Rhythmic steps.
4. Coordinated movements of arms and legs.
5. Keeping the direction of movement while walking.

Older age.

1. Correct posture.
2. Free movement of the arms with bending them at the elbows.
3. Steps are energetic and rhythmic, with a roll from heel to toe.
4. Active flexion and extension of legs in knee joints.
5. Ability to follow different directions while walking and change them.

Running. Examination of preschoolers' running at maximum speed is carried out at distances of 10 or 20 m. On a flat track, the start and finish lines are marked with two lines. Behind the finish line, at a distance of 4-6 m, a flag (cube or bowling pin) is placed and children are asked to run to it to avoid slowing down at the finish line. In this way, the child runs across the finish line on the run. On the command "Ready!" the child approaches the starting line and takes a comfortable running position: one foot forward, toe to the starting line, arms bent at the elbows. On the command "Attention!" the child bends both legs slightly, tilts the torso slightly forward and looks forward in the direction of running. On the command "Run!" he/she starts running. At this point, the stopwatch is switched on, and when the child crosses the finish line, it is stopped. The time is recorded with an accuracy of 0.1 sec. In older groups, two children can run simultaneously, and the result of their running is recorded by two stopwatches. Each child runs the distance twice (with a 4-6 minute rest between each run). The best result is recorded in the protocol, which is compared with the indicators of Table 12.

Table 12

Average running performance at a distance of 10 and 20 m, sec

Age	Gend	Average running performance

	er	Distance 10 m			Distance 20 m		
		Levels: High Points: 5	average 3	Low 2	High 5	average 3	Low 2
3 years	Boys	3,5	3,6-4,1	4,2	6,5	6,6-7,8	7,9
	Girls	3,7	3,8-4,4	4,5	6,9	7,0-8,8	8,9
3 y. 6 m.	Boys	3,4	3,5-3,9	4,0	6,2	6,3-7,4	7,5
	Girls	3,6	3,7-4,2	4,3	6,6	6,7-8,2	8,3
4 years	Boys	3,2	3,3-3,8	3,9	5,8	5,9-7,1	7,2
	Girls	3,4	3,5-4,0	4,2	6,2	6,3-7,7	7,8
4 y. 6 m.	Boys	3,1	3,2-3,6	3,7	5,2	5,3-6,4	6,5
	Girls	3,3	3,4-3,8	3,9	5,8	5,9-7,2	7,3
5 years	Boys	2,9	3,0-3,4	3,5	4,8	4,9-5,7	5,8
	Girls	3,1	3,2-3,6	3,7	5,4	5,5-6,5	6,6
5 y. 6 m.	Boys	2,8	2,9-3,3	3,4	4,6	4,7-5,6	5,7
	Girls	3,0	3,1-3,3	3,4	5,1	5,2-6,2	6,3
6 years	Boys	2,6	2,7-3,1	3,2	4,5	4,6-5,4	5,5
	Girls	2,8	2,9-3,2	3,3	4,8	4,9-5,9	6,0
6 y. 6 m.	Boys	2,4	2,5-2,9	3,0	4,3	4,4-5,2	5,3
	Girls	2,6	2,7-3,1	3,2	4,6	4,7-5,5	5,6

Qualitative running indicators.

Younger age.

1. The trunk is straight or slightly tilted forward.
2. Free movements of arms.
3. Maintaining the direction of running with support on a landmark (flag, cube).

Middle age.

1. Small tilt of a trunk forward.
2. Arms are half bent at the elbows, cross-coordination of arms and legs.
3. Vigorous lifting of the thigh of the swing leg (at an angle of 40-50° to the ground).

4. Rhythmic and straight running.

Older age.

1. Small tilt of a trunk, head straight.

2. Arms are bent at the elbows, moving vigorously back and forth.

3. Vigorous lifting of the thigh of the swing leg (at an angle of 60-70° to the ground).

4. Lowering the push leg to the ground from the toe.

5. Rhythmic and easy running.

Long jump from a spot. A ribbon (rope) is placed on the edge of a gymnastic mat or a pit with sand, and a centimetre tape is placed from it in the direction of the jump to fix its length. The child stands near the ribbon, touching it with his/her toes, and performs a jump, pushing off with both feet as much as possible. After the child lands, measure the distance from the ribbon to the heels touching the surface of the gymnastic mat (sand). The jump is performed three times, the best result is recorded, which is compared with the indicators of Table 13.

Table 13

Average performance in the long jump from a standing position, cm

Age	Gender	Average jump performance		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	65	64-45	44
	Girls	60	59-40	39
3 y. 6 m.	Boys	70	69-50	49
	Girls	65	64-45	44
4 years	Boys	75	74-55	54
	Girls	70	69-50	49
4 y. 6 m.	Boys	80	79-60	59
	Girls	75	74-55	54

5 years	Boys	85	84-65	64
	Girls	80	79-60	59
5 y. 6 m.	Boys	95	94-70	69
	Girls	85	84-66	65
6 years	Boys	110	109-80	79
	Girls	100	99-75	74
6 y. 6 m.	Boys	125	124-95	94
	Girls	115	114-85	84

Qualitative indicators of jump.

Younger age.

1. Starting position - "Swimmer's start" (legs half bent, torso tilted forward, arms back to the sides).

2. Pushing off at the same time with both feet, with a wave of hands upwards.

3. During the "flight" legs are slightly bent.

4. Landing on both feet, arms forward.

Middle age.

1. The correct starting position is "Swimmer's start".

2. Vigorous pushing off with both feet with simultaneous swinging of arms forward and upwards.

3. During the "flight" the legs are bent at the knees.

4. Stable landing on both feet, with rolling from heels to toes, arms forward to the sides.

Older age.

1. The correct starting position is "Swimmer's Start" (legs half-bent at the width of a foot, torso bent forward, arms taken back to the sides).

2. Pushing off with both legs with their full straightening, with an energetic swing of hands forward and upwards.

3. During the "flight" legs are bent at the knees, before landing they are energetically brought forward.

4. Landing on both feet with the transition from the heel to the whole foot.

5. Steady landing on half-bent legs, arms forward and to the sides.

Long jump from a running start. Children jump into a pit with sand from a distance of 10-12 m. The result is recorded with a centimetre tape or measuring tape from the place of push-off (it is marked with a tape to the print closest to the place of push-off), which remains on the sand. The jump is performed three times and its maximum distance is recorded.

Qualitative indicators of jump.

Older age.

1. Equally accelerated run.

2. Vigorous pushing off with one foot with simultaneous swinging of arms forward and upwards.

3. During the "flight" bending of legs in knees, before landing they are brought forward.

4. Landing on both feet with a transition from the heelto the whole foot, arms forward to the sides (table 14).

Table 14

Average performance for the long jump from a running start, cm

Age	Gender	Average jump performance		
		High level	Intermediate level	Low level
		Points: 5	3	2
5 years	Boys	145	144-124	123
	Girls	125	124-110	109
5 y. 6 m.	Boys	165	164-140	139
	Girls	145	144-124	123
6 years	Boys	185	184-160	159
	Girls	165	164-144	143
6 y. 6 m.	Boys	205	204-175	174
	Girls	185	184-160	159

High jump with a running start. The jump is performed from a distance of 6-8 m through a rubber band (cord) at an initial height of 25-30 cm for older children and 30-35 cm for pre-school children. Each subsequent time it is increased by 5 cm.

When a child is unable to overcome the height, they are given two additional attempts. If the child fails to reach this height, the result of the previous attempt is recorded. The maximum height reached by the child is recorded in the protocol. It is advisable to give children 2-3 trial attempts before the examination of jumping.

Qualitative indicators of a jump.

Older age.

1. Perform the run perpendicular to the obstacle (rubber band or cord).
2. Vigorous pushing off with one leg with a simultaneous swing of hands upwards.
3. During the "flight" the legs are bent at the knees as much as possible.
4. Soft and stable landing on semi-bent legs, arms forward to the sides (table 15).

Table 15

Average performance in the high jump from a running start, cm

Age	Gender	Average jump performance		
		High level	Intermediate level	Low level
		Point: 5	3	2
5 years	Boys	47	46-42	41
	Girls	46	45-41	40
5 y. 6 m.	Boys	52	51-46	45
	Girls	50	49-43	42
6 years	Boys	60	59-52	51
	Girls	56	55-48	46
6 y. 6 m.	Boys	67	66-58	57
	Girls	61	60-52	51

Throwing a stuffed ball (weight 1 kg) at a distance with both hands from behind the head, performed from the starting position - sitting on the floor, legs apart. The child makes three attempts in a row, trying to throw the ball as far as possible. The best result of three attempts is recorded and compared with the indicators of Table 16.

Table 16

Average performance of throwing a stuffed ball, m

Age	Gender	Average ball throwing performance		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	1,5	1,49-1,0	99 см
	Girls	1,3	1,29-90 см	89 см
3 y. 6 m.	Boys	1,7	1,69-1,2	1,19
	Girls	1,5	1,49-1,0	99 см
4 years	Boys	1,9	1,89-1,4	1,39
	Girls	1,7	1,69-1,1	1,09
4 y. 6 m.	Boys	2,1	2,09-1,6	1,59
	Girls	1,9	1,89-1,2	1,19
5 years	Boys	2,3	2,29-1,8	1,79
	Girls	2,1	2,19-1,3	1,29
5 y. 6 m.	Boys	2,5	2,49-2,0	1,99
	Girls	2,3	2,29-1,5	1,49
6 years	Boys	2,7	2,69-2,1	2,19
	Girls	2,5	2,49-1,7	1,69
6 y. 6 m.	Boys	3,0	2,99-2,3	2,29
	Girls	2,6	2,59-1,9	1,89

Throwing tennis balls (40 g) for a distance. The child throws the ball from a standing position with the stronger hand (often the right hand) from the line marked on the ground. For ease of measurement, a corridor 5-6 m wide and 12-16 m long is marked on the playground, transverse lines are drawn every 0.5 m and a flag is placed or a number is written (if it is asphalt) corresponding to the number of metres from the throwing site. The distance from the starting line to the place where the ball falls is recorded (its further sliding on the ground is not taken into account). The child performs three throws in a row, the best result is recorded, which is compared with the indicators in Table 17.

Table 17

Average performance of throwing a tennis ball at a distance, m

Age	Gender	Average performance in throwing a tennis ball		
		High level	Intermediate level	Low level
		Points: 5	3	2
3 years	Boys	4,2	4,19-2,7	2,69
	Girls	4,0	3,99-2,2	2,19
3 y. 6 m.	Boys	5,0	4,99-3,0	2,99
	Girls	4,3	4,29-2,6	2,59
4 years	Boys	5,5	5,49-3,4	3,39
	Girls	4,6	4,59-5,0	2,99
4 y. 6 m.	Boys	7,5	7,49-4,0	3,99
	Girls	5,0	4,99-3,5	3,49
5 years	Boys	9,0	8,99-5,0	4,99
	Girls	5,6	5,59-3,8	3,79
5 y. 6 m.	Boys	11,0	10,99-6,0	5,99
	Girls	6,2	6,19-4,2	4,19
6 years	Boys	13,0	12,99-6,5	6,49
	Girls	7,0	6,99-4,5	4,49
6 y. 6 m.	Boys	15,0	14,99-8,0	7,99
	Girls	8,5	8,49-5,5	5,49

Qualitative indicators of throwing.

Younger age.

1. Starting position - standing facing the direction of throwing, legs slightly apart; the arm with which the ball is thrown is bent and elbows.

2. During the swing a small turn of a trunk in the direction of the hand with which the throw is performed.

3. Energetic throw of the ball.

Middle age.

1. Starting position when throwing with the right hand - the child stands on the left side in the direction of throwing, the right foot is set back, at a distance of a

step.

2. During a swing the hand is taken away over a shoulder behind a head.

3. Vigorous throw of the ball in a given direction.

Older age.

1. Starting position - standing sideways in the direction of throwing, a foot at a distance of a step.

2. During the swing with the right hand the body weight is transferred to the right foot.

3. Swinging the arm from behind the back over the shoulder, the back is slightly curved - "the position of a stretched bow".

4. Vigorous throwing of the ball with simultaneous transfer of body weight to the left foot with a simultaneous step forward with the right foot, maintaining balance.

2. In the system of control over physical education of preschool age children the main place is given to the analysis of physical culture lessons as the main form of organised teaching children to physical movements and formation of their physical perfection.

The main content of this control includes:

• determining the level of physical loads on the children's body, their compliance with age and anatomical and physiological capabilities;

- determining the correctness of the class structure and its motor density.

The correctness of the physical education class can be determined by simple research methods:

1. Visual observation allows to identify the correspondence of physical activity to the state of health and the level of motor fitness of pre-schoolers. Observations make it possible to judge the degree of children's fatigue by external signs:

- slight, ordinary fatigue – slight redness of the skin, slight sweating, slightly rapid or even breathing, clear performance of motor tasks, no complaints of fatigue;

- moderate fatigue – significant redness of the skin, significant sweating /especially of the face/, rapid breathing with periodic deep inhalations and

exhalations, impaired coordination of movements /unclear performance of motor tasks, additional movements, slight swaying of the body/, complaints of fatigue;

- significant fatigue /overwork – sharp redness or pallor of the skin /especially of the face/, general significant sweating, frequent, shallow and arrhythmic breathing, impaired coordination of movements, trembling of the limbs, complaints of dizziness, headache, nausea.

Timing allows to calculate the overall and motor density of the class. *The overall density* is measured by the ratio of the rationally used time to the total duration of the lesson as a percentage. The rational time of the lesson includes the time spent on performing exercises, perception and comprehension of explanations, instructions, observation of the demonstration of movements and the performance of exercises by other children, organised analysis of the actions of their comrades, additional actions – re-arrangement, installation of aids, etc. Irrational time expenditures include: premature completion of the class, breaks in the class caused by violation of discipline, poor preparation for the class, etc.

The overall density of a class is considered sufficient if it is at least 80% full. The motor density of the class is calculated according to the following scheme: in the first column, record all types of motor activity of the child /walking, running, doing exercises, playing, etc./, which is observed throughout the class. In the second column, note the stopwatch indications. record the beginning of the lesson and its end. The chart identifies the beginning of each type of child's activity that is being observed. The end of the activity is the beginning of the countdown for the next activity /stopwatch is not switched off/. At the end of the lesson, the time spent on exercises and other types of motor activity is calculated.

Motor density is measured by the ratio of the time spent on direct exercise by the child /who was observed/ to the total time of the class duration in percentage terms. For example, the duration of the lesson in the middle group was 28 minutes. The children performed general developmental exercises, basic movements, participated in outdoor games, and lined up for 20 minutes. Motor density of physical education class in this case is: 20×100:28=71%.

Motor density varies depending on the content, organisation, methodology of the class, availability of sufficient equipment, and motor fitness of children in this group. It will be lower when children are offered new physical exercises that are unfamiliar to them. Optimal motor density of a class should be considered as follows: for a younger group – 60-65 %, middle group – 65-70 %, older group – 70-75 %, preparatory group – 75-80 %. The criterion for the effectiveness of the health-improving effect of a lesson is the indicators of motor density higher than optimal.

Determining physical load makes it possible to assess the impact of exercise on the cardiovascular system of children and determine the physiological curve. An objective indicator of the impact of physical activity on a child is the pulse rate and breathing rate. The pulse rate is counted (in 10-second segments and multiplied by 6) 6-7 times during the class: - before the beginning of the lesson – 3 minutes before it; - after performing general developmental exercises; - in the middle of the main movements (after the second or third movements); - after the last main movement; - after a moving game; - at the end of the final part; - 3-5 minutes after the end of the lesson. Pulse rate depends on individual characteristics of pre-schoolers. Therefore, in some children, the pulse rate may differ significantly from the above average data. With a slight load (balance exercises, throwing objects at a target, at a distance, games of medium mobility), the heart contracts 120 to 136 times per minute. At an average load – 150-160 times per minute. At high load (running at maximum speed, rope climbing, games of high mobility) – 170-180 times per minute.

For children of the main medical group, the maximum permissible loads are those that cause the heart rate in children aged 3-4 to reach 140-160 beats per minute; in children aged 5-6, 150-180 beats per minute, although this state of children should be short – within 2 minutes. With the correct structure of the class, the pulse is restored within 3-5 minutes. In the final part, it is higher than normal. If the pulse is restored in the final part, the load is low, and if after a 5-minute rest the beats are accelerated, the load is too high.

Breathing rate. During rest breathing rate in pre-schoolers has the following values per 1 min: 3 years old – 28-30 times; 4 years old – 26-28 times; 5 years old – 24-28 times; 6 years old – 22-24 times. After exercise, the breathing rate can even

double. When performing intense motor activities, it can reach 50-60 inhalations and exhalations per minute. In case of frequent rapid breathing, shortness of breath during games of great mobility and other physical exercises, they should be stopped. The time of returning the breathing rate after physical education to the initial values depends on the degree of fatigue and the training of the child's body.

CHAPTER 4. PLANS OF PRACTICAL CLASSES

6 semester

Practical classes 1-2.

Topic: Implementation of health technologies in the educational and recreational activities of preschool children

Plan

I. Discussion of theoretical issues:

1. The concepts of "technology", "health-saving technologies", "health technologies".

2. Use of innovative health technologies to preserve and improve the health of preschool children.

3. Health-improving technologies for preventive and therapeutic purposes in the practice of work of preschool education institutions with preschool children.

4. Influence of therapeutic health technologies on physical and mental development of preschool children.

II. Checking and discussing independent work.

Independent work of students

1. Select complexes of finger gymnastics (3 pcs. pieces) for preschool age children: one complex for children of the second junior group, 1 - for middle group, 1 - for senior group.

2. Select complexes of fitball gymnastics (3 pieces), breathing (3 pieces), sound (3 pieces) gymnastics for children: one complex for children of the second junior group, 1 - middle, 1 - senior.

3. Bring to the second class coloured pencils, paints, eraser, a glass of water, napkins, drawing paper, a sheet of album paper, a piece of foil, cotton swabs, an old toothbrush.

4. Draw 2 pictures – one drawing on a landscape sheet or A4 sheet with pencils of an animal that does not exist, give it a name. The second – on a Whatman paper or on 4 A4 sheets or landscape sheets glued together, draw a landscape, using the following means of applying paint: a finger, palm, toothbrush, a piece of crumpled foil, a cotton swab.

Drawing pictures and discussing the results.

Practical performance of various types of gymnastics and therapy by students.

Literary sources

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2. General theory of health and health protection: a collective monograph / edited by Prof. Y. D. Boychuk. Kharkiv: Rozhko S.G. Publishing House, 2017. 488 p.

3. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

4. Koshel V. M., Herman N. V. Content and methods of using health technologies in the educational process of preschool education institutions: a manual. Chernihiv: IE Balykina O. V., 2020. 60 p.

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Practical classes 3.

Topic: History of the origin and development of health technologies

Plan

I. Discussion of theoretical issues:

1. The history of the development of innovative health technologies (fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics).

2. History of the development of preventive and therapeutic health technologies (aromatherapy, phytotherapy, vitamin therapy).

3. The history of the origin and development of therapeutic health technologies (bibliotherapy, laughter therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy).

II. Checking and discussing independent work.

Independent work of students

1. Make a chronological table of the history of the development of health technologies by type: innovative, preventive and therapeutic, therapeutic (in the table).

2. Prepare a presentation on the topic.

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

2. Koshel V. M., Herman N. V. Content and methods of using health technologies in the educational process of preschool education institutions: a manual. Chernihiv: IE Balykina O. V., 2020. 60 p.

3. Lisnevska N. V. The use of traditional and non-traditional means of physical education with preschool children in order to preserve and strengthen their health. Bulletin of the HSPU. Series: Pedagogical sciences. Issue 2 (49). Hlukhiv. 2022. P. 148-156.

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Practical classes 4-5.

Topic: Methods of conducting health technologies with preschool children

Plan

I. Discussion of theoretical issues:

1. Methods of conducting innovative health technologies; fitball gymnastics, breathing gymnastics, sound gymnastics, immune gymnastics, finger gymnastics, psychogymnastics, hydroaerobics.

2. Methods of conducting preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy.

3. Methods of conducting therapeutic health technologies: bibliotherapy, laughter therapy, music therapy, music therapy, art therapy, kinesitherapy, reflexology, game therapy, sand therapy, colour therapy.

II. Checking and discussing independent work.

Independent work of students

1. Describe in the table the methodology of each health technology.

2. Write outlines of classes for children of different ages (on speech development and culture of speech communication, acquaintance with the natural environment, artistic and productive activities, sensory development (for young children) and logical and mathematical development (for preschool children) using health technologies combined with each other.

Literary sources

1. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

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Practical classes 6-7.

Topic: Influence of health technologies on the organism of preschool children

Plan

I. Discussion of theoretical issues:

1. Influence of health technologies on the respiratory system of children.
2. Influence of health technologies on the cardiovascular system of children.
3. Influence of health technologies on the immune system of children.
4. Influence of health technologies on the nervous system of children.
5. Influence of health technologies on the digestive system of children.
6. Influence of health technologies on the excretory system of children.
7. Influence of health technologies on children's musculoskeletal system.

II. Checking and discussing independent work.

Independent work of students

1. Select medicinal herbs to affect the cardiovascular, respiratory, nervous, digestive, and excretory systems.

2. Develop guidelines for the use of aromatic oils on the cardiovascular, respiratory, nervous, digestive, excretory systems.

3. Describe characteristics of influence of health technologies on all systems of children's organism (in the table).

Literary sources

1. Diagnostic methods of health assessment and modern technologies of

preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

7 semester

Practical classes 1-3.

Topic: Characteristics of physical development of preschool children and its control

Plan

I. Discussion of theoretical issues:

1. The concept of physical development and its indicators.
2. Control over physical development: morphological (anthropometric) indicators.
3. Control over physical development: somatoscopic indicators.
4. Control over physical development: physiometric (functional) indicators.
5. Monitoring of children's health.

II. Checking and discussing independent work.

Independent work of students

1. Conduct research on morphological (somatometric) indicators: measurements of body weight, height and chest circumference of preschool children (group of choice) and compare them with the average, draw conclusions;

2. Conduct a study on dental indicators: the shape of the chest, limbs; the degree of fat deposition.

3. Carry out research on physiometric (functional) indicators: the state of the cardiovascular system, muscle strength of the hands (dynamometry).

Literary sources

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2. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

Practical classes 4-6.

Topic: Formation of correct posture and arch of the foot as an indicator of physical development of preschool children

Plan

I. Discussion of theoretical issues:

1. Features of posture formation in children.
2. Features of the formation of the arch of the foot in children..

II. Checking and discussing independent work.

Independent work of students

1. Determine the posture of preschool children (by several methods) (group of choice), to analyse its disorders.

2. Determine the state of the arch of the foot in preschool children (by several methods) (group of choice), to analyse its disorders.

Literary sources

1. Vilchkovsky E.S., Kurok O.I. Theory and methods of physical education of preschool children. Sumy: VTD University Book, 2019. 436 p.

2. Diagnostic methods of health assessment and modern technologies of preschool children's health protection: a textbook / Authors-compilers Lisnevska N.V., Skrypka I.M. Sumy: IE Tsioma S.P., 2022. 274 p.

Practical classes 7-8.

Topic: Additional examination of preschool children's health status in the conditions of preschool education institutions

Plan

I. Discussion of theoretical issues:

1. Examination of the correspondence of the biological age of preschool children to the passport age.
2. Determination of children's body resistance (body resistance to negative factors).
3. Determination of reactivity of children's organism (degree of resistance to adverse effects).
4. Determination of physical performance of children's organism.
5. Study of adaptive reactions of children's organism.

II. Checking and discussing independent work.

Independent work of students

1. Conduct an examination of children's body resistance (group of your choice).

2. Analyze the morbidity status of preschool children, determine the number of chronic and infectious diseases (group of choice).

Literary sources

1. Barriers. Phagocytosis: methodical instructions for the discipline "Pathological Physiology" for bachelor students (speciality "Nursing") / compiled by. O.V. Nikolaieva, O.M. Shevchenko, O.O. Pavlova and others. Kharkiv: KHNMU, 2016. 12 p.

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Practical classes 9-11.

Topic: Control over the physical development of preschool children

Plan

I. Discussion of theoretical issues:

1. Methods of determining the level of development of motor (physical) qualities of children.
2. Assessment of children's motor fitness.
3. Control over physical culture classes.

II. Checking and discussing independent work.

Independent work of students

1. Determine the level of development of physical qualities in preschool children (group of choice).

2. Assess the motor readiness of preschool children (group of choice).

Literary sources

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CHAPTER 5. THE ISSUE OF MODULAR CONTROL

Questions of modular test for the discipline "Health technologies and diagnostic methods of physical education of preschool children".

Module I.

Topic 1: Implementation of health technologies in educational and recreational activities of preschool children

Variant I

1. Define the concepts of "technology", "health-saving technologies", "health technologies".

2. Describe innovative health technologies for preserving and improving the health of preschool children.

Variant II

1. Give a description of health technologies for preventive and therapeutic purposes in the practice of work of PEI with preschool children.

2. Describe health technologies of therapeutic orientation on physical and mental development of preschool children

Topic 2. History of the origin and development of health technologies

Variant I

1. The history of the origin and development of innovative health technologies: fitball gymnastics, breathing gymnastics, sound gymnastics.

Variant II

1. The history of the origin and development of preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy.

Variant III

1. History of the origin and development of therapeutic health technologies: music therapy, art therapy, reflexology, colour therapy.

Topic 3. Methods of conducting of health technologies with preschool children

Variant I

1. Methods of conducting of innovative health technologies: fitball gymnastics, breathing gymnastics, sound gymnastics, finger gymnastics, psychogymnastics.

Variant II

1. Methods of conducting of preventive and therapeutic health technologies: aromatherapy, phytotherapy, vitamin therapy.

Variant III

1. Methods of conducting of therapeutic health technologies: music therapy, art therapy, kinesitherapy, reflexology, colour therapy.

Topic 4. Influence of health technologies on the body of preschool children

Variant I

1. Influence of health technologies on the respiratory and cardiovascular systems of children.

Variant II

1. Influence of health technologies on the immune and nervous systems of children.

Variant III.

1. Influence of health technologies on the digestive and excretory systems of children.

Variant IV

1. Influence of health technologies on children's musculoskeletal system.

Module II.

Topic 5. Characteristics of physical development of preschool children and its control

Variant I

1. The concept of physical development and its indicators. Control over the state of health of children.
2. Control over physical development: morphological (anthropometric) indicators.

Variant II

1. Control over physical development: somatoscopic indicators.
2. Control over physical development: physiometric (functional) indicators.

Module III.

Topic 6. Formation of correct posture and arch of the foot as an indicator of physical development of preschool children

Variant I

1. Features of posture formation in children.

Variant II

2. Features of the formation of the arch of the foot in children.

Topic 7: Additional examination of the health status of preschool children in the conditions of preschool education institutions

Variant I.

1. Examination of the correspondence of the biological age of preschool children to the passport age.
2. Determination of children's body resistance.
3. Determination of reactivity of children's organism.

Variant II.

1. Determination of physical performance of children's organism.
2. Study of adaptive reactions of children's organism.
3. Determination of psychophysical state of preschool children.

Topic 8. Control over physical development of preschool children

Variant I.

1. Methods of determining the level of development of motor (physical) qualities of children.
2. Control over physical culture classes.

Variant II

1. Assessment of children's motor fitness.
2. Control over physical culture classes.

CHAPTER 6. METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

Methodological recommendations for students to perform independent work on «Health technologies and diagnostic methods of physical education of children»

Module I. Theoretical foundations of the course "Health technologies and diagnostic methods of physical education of preschoolers" and methodological guidance on the use of health technologies in work with children

Topic: Implementation of health technologies in the educational and recreational activities of preschool children

1. Select complexes of finger gymnastics (3 pcs. pieces) for preschool age children: one complex for children of the second junior group, 1 - for middle group, 1 - for senior group.

2. Write complexes of fitball gymnastics (3 pieces), breathing (3 pieces), sound (3 pieces) gymnastics for children: one complex for children of the second junior group, 1 - middle, 1 - senior.

3. Bring to the second class coloured pencils, paints, eraser, a glass of water, napkins, drawing paper, a sheet of album paper, a piece of foil, cotton swabs, an old toothbrush.

III. Drawing pictures and discussing the results.

IV. Practical performance of various types of gymnastics and therapy by students.

Topic: History of the origin and development of health technologies

1. Make a chronological table of the history of the development of health technologies by type: innovative, preventive and therapeutic, therapeutic (in the table).

2. Prepare a presentation on the topic.

Topic: Methods of conducting health technologies with preschool children

1. Describe in the table the methodology of each health technology.

2. Write outlines of classes for children of different ages (on speech development and culture of speech communication, acquaintance with the natural environment, artistic and productive activities, sensory development (for young children) and logical and mathematical development (for preschool children) using health technologies combined with each other.

Topic: Influence of health technologies on the organism of preschool children

1. Select medicinal herbs to affect the cardiovascular, respiratory, nervous, digestive, and excretory systems.

2. Develop guidelines for the use of aromatic oils on the cardiovascular, respiratory, nervous, digestive, excretory systems.

3. Describe characteristics of influence of health technologies on all systems of children's organism (in the table).

Module II. Methodological guidance on the use of diagnostic methods to determine the physical development of preschool children

Topic: Characteristics of physical development of preschool children and its control

1. Carry out research on morphological (somatometric) indicators: measurements of body weight, height and chest circumference of preschool children (group of choice) and compare them with the average, draw conclusions.

2. Carry out research on somatoscopic indicators: shape of chest, limbs; degree of fat deposition, draw conclusions.

3. Perform research on physiometric (functional) indicators: the state of the cardiovascular system, muscle strength of the hands (dynamometry).

Module III. Methodological guidance on the use of diagnostic methods to determine the health status of preschool children

Topic: Formation of correct posture and arch of the foot as an indicator of physical development of preschool children

1. Determine posture in preschool children (by several methods) (child of choice), analyse its disorders;

2. Determine the state of the arch of the foot in preschool children (by several methods) (child of choice), analyse its disorders.

Topic: Additional examination of preschool children's health status in the conditions of preschool education institutions

1. Study the lecture material and prepare for practical activities.

2. Conduct an examination of children's body resistance (group of your choice).

Module IV. Methodological guidance for monitoring children's physical development

Topic: Control over the physical development of preschool children

1. Work out the lecture material.

2. Determine the level of development of physical qualities in preschool children (group of choice).

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тел/факс (05444) 2-33-06.
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