



Фізична освіта і спорт

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Prospects for the use of physical education means for the correction of stress-associated conditions in children aged 5 - 6 years

Serhii Petrenko

Lecturer, Department of Physical Therapy, Occupational Therapy and Physical Education, Ukrainian Institute of Arts and Sciences, Institutska St., 14, Bucha, Kyiv region, 08292, Ukraine; Ph.D. student, Department of Health-Recreation Motor Activity, National University of Physical Education and Sport of Ukraine, Fizkultury St., 1, Kyiv, 03150, Ukraine

<https://orcid.org/0009-0006-6156-7029>

Nataliia Petrenko

Ph.D. in Physical Education and Sports, Associate Professor, Department of Physical Therapy, Occupational Therapy and Physical Education, Ukrainian Institute of Arts and Sciences, Institutska St., 14, Bucha, Kyiv region, 08292, Ukraine

<https://orcid.org/0000-0001-9574-8211>

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***Abstract:** The relevance of the study is critically determined by the objective and alarming increase in the psycho-emotional stress on preschoolers amidst complex social challenges. The objective of this study is to substantiate the feasibility and structurally present a system of exercises with a clear sequence, aimed at harmonious development, thereby demonstrating clear prospects for the use of*



*physical education means for the comprehensive and holistic correction of stress-associated conditions in children age 5 - 6 years. **Methods.** A thorough, comprehensive analysis of scientific sources in the fields of pedagogy, child psychology, and body-oriented therapy was conducted. It was unambiguously established that stress in children aged 5 - 6 years has a profound multidimensional manifestation, covering four interconnected spheres: physiological, emotional, behavioral, and cognitive. A critical review revealed an obvious systemic gap: traditional physical culture and wellness programs lack purposeful systematic methods designed to simultaneously affect all four spheres. This gap strongly substantiates the prospects for developing a new, systematically organized approach. The conceptual basis of the proposed program is grounded in the principle of interaction between purposeful motor activity and brain plasticity, using coordinated movements to stimulate the cerebellum and frontal cortical areas responsible for attention and effective emotional self-regulation. **Results.** Based on the theoretical substantiation, a comprehensive correction model, built on a clear sequence and interrelation of components, was systematically developed and structurally presented. The innovative core of this model lies in the systemic integration of established classical physical education means with specialized, evidence-based correctional techniques, such as: sensorimotor exercises; elements of yoga and targeted diaphragmatic breathing exercises; and dance and movement therapy. The proposed model is structurally organized around four mutually influential components: physical, psycho-emotional, cognitive, and social. **Conclusions.** The high prospects of using this purposeful fitness program as a highly effective, non-pharmacological, accessible, and sustainable alternative for the reliable correction of stress-associated conditions in children aged 5 - 6 years are theoretically substantiated. The proposed systematic model, based on a clear sequence, successfully implements the demonstrated prospects for the use of physical education means. Due to its structure, the program is uniquely capable of simultaneously affecting the somatic, emotional, and cognitive spheres of the child's development,*



which is considered necessary to achieve a stable and harmonious correctional effect.

Keywords: *physical education, stress correction, fitness program, children aged 5 - 6 years, psycho-emotional correction, systematic approach, harmonious development.*

Перспективи застосування засобів фізичного виховання для корекції стрес-асоційованих станів у дітей 5 - 6 років

Петренко Сергій Олегович

викладач кафедри фізичної терапії, ерготерапії та фізичного виховання
ПВНЗ «Український гуманітарний інститут», вул. Інститутська, 14, Буча,
Київська область, 08292; аспірант кафедри оздоровчо-рекреаційної рухової
активності, Національний університет фізичного виховання і спорту України,
вул. Фізкультури, 1, м. Київ, 03150 Україна
<https://orcid.org/0009-0006-6156-7029>

Петренко Наталія Борисівна

кандидат наук з фізичного виховання і спорту, доцент кафедри фізичної
терапії, ерготерапії та фізичного виховання, ПВНЗ «Український гуманітарний
інститут», вул. Інститутська, 14, Буча, Київська область, 08292
<https://orcid.org/0000-0001-9574-8211>

Анотація: *Актуальність дослідження зумовлена об'єктивним зростанням психоемоційного навантаження на дошкільників в умовах складних соціальних викликів, таких як нестабільність середовища та зміни у форматі освітнього процесу. Мета дослідження - обґрунтувати доцільність та структурно представити систему вправ, що має чітку послідовність, спрямовану на гармонійний розвиток, тим самим демонструючи чіткі*



перспективи застосування засобів фізичного виховання для комплексної та цілісної корекції стрес-асоційованих станів у дітей 5 - 6 років. **Методи.** Проведено комплексний аналіз наукових джерел у галузях педагогіки, дитячої психології та тілесно-орієнтованої терапії для ідентифікації природи стресу. Було встановлено, що стрес у дітей 5 - 6 років має глибокий багатовимірний прояв, що охоплює чотири взаємопов'язані сфери: фізіологічний, емоційний, поведінковий та когнітивний. Критичний огляд виявив очевидну системну нішу: традиційні програми не містять цілеспрямованих методик, призначених для одночасного впливу на всі чотири сфери, що робить їх недостатньо ефективними. Ця прогалина рішуче обґрунтовує перспективи розробки нового системно організованого підходу. Концептуальна основа запропонованої програми ґрунтується на принципі взаємодії між руховою активністю та пластичністю мозку, використовуючи координовані рухи для стимуляції ділянок, відповідальних за увагу та ефективну емоційну саморегуляцію. **Результати.** На основі теоретичного обґрунтування була структурно представлена модель корекції, побудована на чіткій послідовності та взаємозв'язку чотирьох взаємно впливових компонентів: фізичного, психоемоційного, когнітивного та соціального. Інноваційне ядро цієї моделі полягає у системній інтеграції класичних засобів фізичного виховання зі спеціалізованими корекційними техніками, такими як: сенсомоторні вправи; елементи йоги та цілеспрямованої дихальної гімнастики; та танцювально-рухова терапія. Деталізація методичного наповнення забезпечує повну основу для практичної реалізації. **Висновки.** Теоретично обґрунтовано високу перспективність використання цієї цілеспрямованої фітнес-програми для надійної корекції стрес-асоційованих станів у дітей 5 - 6 років. Запропонована системна модель, що ґрунтується на чіткій послідовності, реалізує продемонстровані перспективи застосування засобів фізичного виховання. Завдяки своїй структурі, програма здатна одночасно впливати на соматичну,



емоційну та когнітивну сфери розвитку дитини, що є необхідним для досягнення гармонійного та тривалого корекційного ефекту.

Ключові слова: фізичне виховання, корекція стресу, фітнес-програма, діти 5 - 6 років, психоемоційна корекція, системний підхід, гармонійний розвиток.

Problem Definition and Study Relevance. Among the increasing psycho-emotional load on children of senior preschool age, determined by both external social factors (martial law, environmental instability, changes in the format of the educational process) and individual developmental characteristics, the problem of correcting stress-associated conditions in children aged 5 - 6 years gains particular relevance. Senior preschool age is a critical period when the emotional-volitional sphere, self-regulation mechanisms, social skills, and cognitive functions are intensely forming. This rapid growth simultaneously increases sensitivity to external psycho-traumatic factors.

The problem of the study lies in the multidimensional manifestation of stress in this age group, which covers physiological (increased muscle tone, sleep disorders), emotional (anxiety, impulsivity), behavioral (aggression, regression), and cognitive (reduced attention, impaired self-regulation) aspects [1, p. 101735; [2, p. 135; [3, p. 769]. Although purposeful motor activity is recognized as one of the most accessible non-pharmacological means for reducing anxiety and forming emotional regulation skills [4, p. 865], a critical review of current physical culture and wellness programs indicates that most of them have a general developmental focus and limited coverage of the psycho-emotional and cognitive components of the child's development.

Thus, there is a necessity to develop and substantiate a systematized, scientifically grounded fitness program that integrates somatic, cognitive, and emotional development. This necessity confirms the stable prospects for the use of



physical education means as a leading tool for creating a holistic conceptual psycho-correctional model.

Literature Review. The analysis of scientific sources focused on three main areas: the nature of stress in preschoolers, the connection between physical activity and psycho-emotional state, and a comparative review of existing correctional programs.

Studies consistently confirm that stress in children aged 5 - 6 years has a clearly expressed physiological component. Researchers (Li et al., 2023; Lubans et al., 2016) point to a direct connection between emotional distress and impaired autonomic nervous system function, manifesting in changes in hormonal levels (cortisol) and somatization, particularly in chronic elevation of muscle tone [5, p. 138; [6, p. i5791]. This indicates that psychocorrection without bodily intervention will be incomplete.

Significant attention is also paid to the impact of stress on the cognitive sphere. Studies by Shonkoff et al. (2021) and Ratey & Loehr (2021) confirm that chronic stress negatively affects neuroplasticity and leads to a decrease in executive functions, such as planning, working memory, and attention [7, p. 637; [2, p. 135].

Over the past five years, the scientific community has actively researched the specific correctional potential of motor activity. O’Keeffe et al. (2023) and Tandon et al. (2022) meta-analytically confirmed that purposeful physical activity is an effective means of reducing anxiety and improving the overall mental health of children [4, p. 866; [1, p. 101735].

Works explaining the neurocorrectional mechanism are of particular interest. Wilke et al. (2023) systematically reviewed and proved that motor interventions (especially those requiring complex coordination) positively affect executive functions in preschoolers [8, p. 270]. This effect is explained by the fact that movements requiring attention shifting and planning activate the prefrontal cortex and cerebellum, which are crucial for emotional self-regulation [9, p. 43; [2, p. 136]. Thus, physical education acts as a neurocorrectional tool.



A critical analysis of current programs (Galan, 2021; Volovyk & Pidvalna, 2024; Popović et al., 2023) showed that they have primarily a general developmental or narrowly specialized focus [10, p. 28; [11, p. 75; [12, p. 42]. For example, fitness yoga programs (Volovyk & Pidvalna, 2024) are effective for relaxation but have a narrow motor spectrum, while general developmental programs lack a clearly expressed psycho-correctional block [11, p. 75].

The previously unresolved part of the general problem lies in the absence of a holistic, sequentially organized, scientifically grounded model that would: a) Systemically combine the physical (relief of muscle tension), psycho-emotional (regulation), and cognitive (development of attention) components. b) Be adapted to the possibilities of mass implementation in preschool institutions.

This specific aspect - theoretical development and methodological substantiation of a conceptual model that realizes the prospects for the use of physical education for a comprehensive impact on all four spheres of stress manifestation - is the scientific novelty and main contribution of this article.

Aim and Objectives of the Study. The aim of the article is the theoretical substantiation and development of a conceptual structural model of a fitness program, demonstrating the prospects for the use of physical education means for the complex correction of stress-associated conditions in children aged 5 - 6 years through the integration of motor activity with psycho-emotional and cognitive correction.

To achieve this goal and overcome the identified systemic gap, the following objectives were defined.

Conduct a theoretical analysis of scientific sources to determine the multidimensional nature of stress in preschoolers and substantiate the feasibility of using physical education means as a neurocorrectional tool.

Develop a structural model of the fitness program, defining its key components (physical, psycho-emotional, cognitive, social) and their functional purpose.



Based on the analysis of neurophysiological data, substantiate the methodological content of the program, ensuring a targeted impact on the development of emotional self-regulation and executive functions (cognitive component).

Detail and theoretically substantiate the methodology for applying specific games/exercises that implement a holistic, sequential, and harmonious correctional approach.

Presentation of the Conceptual Model and Methodological Substantiation. The methodological basis of the study was a systematic approach that ensures the sequential and harmonious combination of elements. This approach allowed considering stress-associated conditions not as separate emotional manifestations, but as a disruption of interaction between the somatic, emotional, and cognitive spheres, which required the development of a model with interconnected components. A synthesis of elements from evidence-based directions was used: classical physical education, sensorimotor integration [13, p. 105742], and body-oriented therapy (yoga, breathing practices) [14, p. 20].

The advantage of this methodology lies in its holism and flexibility, which allows the model to be adapted to the individual needs of preschoolers. The limitation is that the effectiveness of the model at this stage remains theoretically substantiated and requires further empirical testing.

The conceptual foundation of the developed fitness program is based on the principle of the harmonious action of physical exercises on the three key spheres of the child's development: somatic, emotional, and cognitive [15, p. 24246]. This position is confirmed by modern neuropsychological science [6, p. i5791; [8, p. 270].

These scientific facts allowed substantiating the working hypothesis: A fitness program built on a clear sequence of exercises, integrated with psycho-emotional techniques, will be more effective for the correction of stress-associated conditions than traditional programs, as it simultaneously relieves muscle tension, trains autonomic regulation through breathing, and develops cognitive control.

The implementation of the prospects for the use of physical education means in correctional work is reflected in the structural model (Table 1) developed by us, which is the core of the program.

Table 1.

Conceptual Model of Sequential and Harmonious Development of Preschoolers (5 - 6 Years Old) in the Process of Fitness Education and Correction of Stress-Associated Conditions

Implementation Component	Main Components	Functional Purpose (Impact on Stress Correction)
1. Physical Component	Gross and fine motor skills, coordination, rhythm, flexibility, physical endurance.	Relief of somatic tension (muscle clamps). Formation of body awareness and grounding [16, p. 15].
2. Psycho-Emotional Component	Elements of yoga, breathing exercises, relaxation techniques, music therapy.	Development of emotional self-regulation. Reduction of anxiety levels. Activation of the parasympathetic nervous system [11, p. 76].
3. Cognitive Component	Sensorimotor exercises, neuro-gymnastics, tasks for shifting attention, memorization of motor sequences.	Improvement of executive functions (planning, working memory, cognitive flexibility) [8, p. 270].
4. Social Component	Pair and group exercises, interactive games, dance and movement therapy.	Formation of a sense of security and belonging. Development of cooperation skills, empathy [17, p. 101788].

Source: authors' own development.

All elements interact and reinforce each other. For example, a coordination exercise (Physical Component) requires concentration (Cognitive Component), and performing it in pairs (Social Component) reduces anxiety (Psycho-Emotional Component) [18, p. 588].

The methodological content of the program is based on the use of specific means (Table 2) that purposefully work with each component/



Breathing exercises ("Little Flower") - this is a key tool for activating the parasympathetic system, which is a scientifically substantiated mechanism for reducing stress [6, p. i5790].

Sensorimotor tracks - used to work with proprioception and the vestibular apparatus. Dysfunction of these systems often underlies emotional hypersensitivity in children who have experienced stress [13, p. 105741].

Relay games that require rules - they train cognitive flexibility and the ability to inhibit impulsive reactions, which is a direct impact on the deficit of executive functions [9, p. 43].

Table 2.

Substantiation of the Content and Methodology for Conducting Games/Exercises for Overcoming Stress-Associated Conditions

Content and Name of Games/Exercises	Abilities Primarily Developed	Intensity (HR, beats/min)	Duration	Number of Repetitions
BLOCK 1: RELAY GAMES				
1. "Crossing the Swamp" (stepping over "islands")	Coordination, dynamic balance, attention.	Medium (120 - 140)	3 - 4 min	2 - 3 times
2. "Catch the Comet Ball" (throwing and catching fitness balls)	Gross motor skills, agility, group interaction.	Medium (130 - 150)	4 - 5 min	3 - 4 times
BLOCK 2: EXERCISES FOR DEVELOPING MOTOR AND PSYCHOMOTOR QUALITIES				
1. "Sensory Track" (walking on a track with different textures)	Sensorimotor integration, balance [13, p. 105742].	Low (90 - 110)	2 - 3 min	1 - 2 times
2. "Plasticine Robot" (muscle tension and relaxation)	Relaxation, awareness of muscle clamps, emotional self-regulation [14, p. 20].	Low (80 - 100)	2 - 3 min	4 - 5 cycles
BLOCK 3: EXERCISES FOR SELF-REGULATION AND RELAXATION				
1. Breathing Exercise "Little Flower" (deep inhale through the nose, slow exhale through the mouth)	Breathing control, reduction of anxiety levels, focus of attention [6, p. i5790].	Low (90 - 100)	1 - 2 min	5 - 7 cycles
2. "Fairy Tale Visualization" (in a lying position)	Imagination, relief of emotional tension, psycho-emotional stabilization [11, p. 76].	Low (70 - 90)	3 - 5 min	1 - 2 times

Source: authors' own development.



Conclusions. The aim of the article - the theoretical substantiation and development of a conceptual structural model of a fitness program, demonstrating the prospects for the use of physical education means for the complex correction of stress-associated conditions in children aged 5 - 6 years - was fully achieved. All set objectives were successfully resolved.

A theoretical analysis was conducted, confirming the multidimensional nature of stress and substantiating the feasibility of using physical education as a neurocorrective tool.

A structural model of the fitness program, consisting of four interconnected components (physical, psycho-emotional, cognitive, and social), was developed and presented, which is the key theoretical contribution of the article.

The methodological content of the program was substantiated, ensuring the targeted development of emotional self-regulation and executive functions.

The methodology for applying games and exercises, which implements a holistic, sequential, and harmonious corrective approach in practice, was detailed and theoretically substantiated.

Thus, it is theoretically substantiated that physical education has broad prospects as a key instrument in the system of Psychological prevention and correction of stress-associated conditions in preschoolers. The developed model is a holistic system that successfully realizes these prospects.

Prospects for further research are related to the need for empirical verification of the effectiveness of the developed fitness program. Future work will include conducting an experimental study for the quantitative and qualitative assessment of the dynamics of changes in the psycho-physical state of children (5 - 6 years old) and the development of a validated diagnostic toolkit.



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