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PHYSICAL REHABILITATION WITHIN THE FRAMEWORK OF ADAPTIVE PHYSICAL CULTURE

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Abstract. The article examines physical rehabilitation within the framework of adaptive physical culture as a crucial means of restoring motor functions in individuals with disabilities and health limitations. The physiological foundations of motor rehabilitation are revealed, along with the main goals, stages, principles, methods, and means of restoring impaired movements. Special attention is given to the role of the adaptive physical culture specialist in the rehabilitation process, as well as to the expected outcomes of implementing rehabilitation programs. The comprehensive nature of adaptive physical culture is emphasized, as it is aimed not only at physical recovery but also at social integration and improvement of the quality of life of participants.

Keywords: adaptive physical culture, physical rehabilitation, restoration of motor functions, health limitations, disability, neuroplasticity, motor activity, rehabilitation exercises, social integration.

Main objectives:
1) Restoration of motor functions
2) Improvement of endurance, strength, and coordination
3) Reduction of pain syndrome
4) Adaptation to daily life and society
5) Prevention of complications
6) Social integration

Physical rehabilitation is a systematic set of measures aimed at restoring, compensating for, or maintaining body functions impaired as a result of diseases, injuries, or chronic conditions. Within adaptive physical culture, it is applied primarily for individuals with health limitations and disabilities.

The main objectives of physical rehabilitation include restoring motor functions, improving strength, endurance, coordination, and joint mobility, reducing pain, preventing secondary complications, and promoting social integration. Rehabilitation in this context uses a variety of scientifically grounded methods, including passive and active exercises, isometric training, coordination and balance exercises, hydrotherapy, sensory stimulation, and functional task practice.

By combining these methods with individualized programs, gradual progression, and continuous monitoring, adaptive physical culture not only facilitates physical recovery but also enhances self-confidence, motivation, and independence, helping participants reintegrate into daily life and participate actively in society. The holistic approach ensures that rehabilitation addresses both physical and psychosocial aspects, making it an essential tool for improving overall quality of life in individuals with disabilities or health limitations.

Restoration of motor functions in adaptive physical culture. Restoration of motor functions is one of the key objectives of adaptive physical culture (APC). It is aimed at recovering or compensating for

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impaired movements, coordination, strength, endurance, and joint mobility lost due to illnesses, injuries, or congenital disorders. The primary goal is to enable individuals with health limitations to perform motor activities independently and fully, ensuring active daily life and social adaptation.

This process also contributes to the improvement of overall physical fitness, prevention of secondary complications, and enhancement of neuromuscular control. APC employs a combination of therapeutic exercises, coordination and balance training, isometric and active movements, as well as sensory stimulation and water-based therapy to optimize recovery. By focusing on individualized programs and gradual progression, adaptive physical culture not only restores physical capabilities but also promotes self-confidence, motivation, and social integration, allowing participants to lead a more active and fulfilling life.

Physiological foundations of motor function restoration.

Motor function is the result of a complex interaction between the nervous, muscular, and musculoskeletal systems, as well as regulatory mechanisms that ensure coordination and precision of movements. In cases of impairment (e.g., after stroke, spinal injuries, amputations, or diseases of the joints and muscles), an imbalance occurs between central and peripheral control of movements. Such disruptions often lead to reduced strength, limited range of motion, impaired coordination, and decreased functional independence.

The task of an adaptive physical culture (APC) specialist is to activate the preserved structures, stimulate the plasticity of the nervous system, and promote the formation of new motor connections (neural pathways). Regular and appropriately dosed exercises enhance nerve impulse conduction, sensorimotor integration, and muscular coordination, while normalizing muscle tone and improving joint mobility. Techniques such as passive, active, and isometric exercises, coordination training, and hydrotherapy not only restore physical capabilities but also strengthen the body's compensatory mechanisms.

Moreover, the process of motor rehabilitation in APC leverages neuroplasticity, enabling the nervous system to reorganize itself and form alternative pathways for movement control. This physiological adaptation, combined with motivation, psychological support, and gradual progression of exercises, ensures long-term functional recovery and the ability to perform daily activities independently, contributing to social integration and overall quality of life.

Regular physical exercises with a measured load contribute to:

1. Improvement of nerve impulse conduction

2. Activation of sensorimotor integration (interaction between perception and movement)

3. Normalization of muscle tone (reduction of spasticity, increase in strength of weakened muscles)

4. Development of coordination and balance

5. Improvement of blood circulation and tissue nutrition, which accelerates the recovery of damaged structures.

Main stages of motor function restoration

1. Preparatory stage

Goal: activation of the body, elimination of pain, and enhancement of motivation for movement.

Methods used:

1. Breathing exercises
2. Passive and passive-active movements
3. Gentle self-massage and stretching
4. Relaxation exercises and sensory stimulation (touch, vibration, thermal effects)

2. Main stage

Goal: restoration of active movements, coordination, and balance.

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Methods used:
1. Exercises for developing fine and gross motor skills (hand manipulations, grasping, transferring objects)
2. Coordination exercises (walking, balancing, stepping movements)
3. Isometric exercises (muscle tension without movement to strengthen weakened muscles)
4. Support-based exercises (using a chair, wall, or handrails) — for restoring standing and walking skills
5. Water-based exercises (hydrokinesiotherapy) — a safe and effective method for movement recovery with joint unloading

3. Final stage (functional improvement stage)
Goal: consolidation of motor skills and their integration into daily life.
Methods used:
1. Cyclical activities (walking, swimming, cycling on a stationary bike)
2. Play-based exercises aimed at coordination and reaction
3. Imitation exercises simulating every day and professional tasks (climbing stairs, carrying objects, self-care activities)

Principles of motor function restoration

1) Gradualness and consistency — the increase in load should occur smoothly, taking into account the individual's health status and progress.
2) Active participation — rehabilitation is effective only with the conscious involvement and positive motivation of the participant.
3) Comprehensive approach — combination of physical exercises, massage, physiotherapy, and psychological support.
4) Differentiated approach — selection of exercises depending on the type of impairment (spasticity, paresis, contracture, amputation, etc.).
5) Feedback — continuous monitoring of the body's response (heart rate, breathing, signs of fatigue, pain).

Methods and means of motor function restoration

Method	Description	Purpose / Effect
Passive and passive-active movements	Movements performed with the help of an instructor or with partial participation of the individual	Stimulation of muscles and joints, improvement of blood circulation
Active exercises with support	Using walls, handrails, climbing frames; semi-squats, weight shifting	Development of balance and confidence in movements
Isometric exercises	Tension of specific muscle groups without movement	Strengthening weakened muscles without overload
Coordination exercises	Balancing, ball exercises, equilibrium exercises, stepping combinations	Restoration of movement accuracy
Hydrokinesiotherapy (water-based exercises)	Swimming, movements in the pool with support	Joint unloading, development of movement amplitude and strength
Biofeedback	Using sensory devices to track movements	Control of accuracy and range of motion, training self-regulation

The role of an adaptive physical culture (APC) specialist in the restoration of motor functions
An adaptive physical culture (APC) specialist must have knowledge of anatomy, physiology, kinesiology, and psychology to appropriately select methods and regulate the exercise load.

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The specialist monitors:
1. The correctness of exercise execution
2. The body's response to activity
3. The emotional state of the participant

The instructor also creates a motivational environment, maintains a positive attitude, and helps the individual recognize their own achievements, which significantly accelerates the recovery process.

Expected outcomes of implementing a rehabilitation program

1) Increase in joint range of motion
2) Reduction of muscle spasticity and pain syndrome
3) Improvement of coordination, balance, and movement accuracy
4) Enhancement of overall physical performance
5) Development of stable motor skills for self-care and social activity

The process of restoring motor functions in adaptive physical culture is a comprehensive and long-term effort aimed not only at physical rehabilitation but also at the overall recovery of the individual.

Regular and properly selected exercises contribute to the restoration of lost motor abilities, enhance self-esteem, and help the individual return to an active life in society.

Conclusion

Restoration of motor functions in adaptive physical culture is a complex, multi-stage, and individually oriented process aimed at recovering, compensating, and developing lost or impaired motor abilities. The use of scientifically grounded methods and means of physical rehabilitation contributes to the activation of the body's compensatory mechanisms, the development of neuroplasticity, and the formation of new motor skills.

A comprehensive approach, including systematic physical exercises, sensory stimulation, psychological support, and social adaptation, significantly enhances the effectiveness of the rehabilitation process. The adaptive physical culture specialist plays a key role in ensuring safety, motivation, and individualization of activities.

Thus, adaptive physical culture serves not only as a means of physical rehabilitation but also as an important factor in restoring the individual, improving self-esteem, and enabling a return to an active and fulfilling life in society.

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