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Descrierea CIP a Bibliotecii Naționale a României

POPESCU, VIORELA ELENA

A study on recovery through passive resting among university students aged 18 to 20 / Viorela Elena Popescu. - București :

Editura Thea ; Craiova : Universitaria, 2025

ISBN 978-606-95771-5-8

ISBN 978-606-14-2157-2

796

Viorela-Elena Popescu

A study on recovery through passive resting among university students aged 18 to 20

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București, 2025

Craiova, 2025

CUPRINS

FOREWORD	7
Chapter 1	
The Theory Of Recovery	9
1.1. The Concept Of Recovery	9
1.2 Principles Of Recovery	11
1.3 Mechanisms Of Recovery	14
1.4 Phases Of Recovery	19
Chapter 2	
Biopsychological Characteristics Of Young People	22
2.1 Biological Characteristics	22
2.2 Psychological Features	28
2.3 Social Features	29
Chapter 3	
Passive Rest	31
3.1 Human Physiology	31
3.1.1 Physio-Chemical And Biological Physiology	31
3.1.2 Energetic Physiology	38
3.2 Psychology And Physiology Of The Sleep Phenomenon	39
3.3 The Quality Of Sleep	41
3.4 Ways Of Inducing Sleep	45
Chapter 4	
Personal Approach To Investigating The Quality And Quantity Of Sleep In Students Aged 18–20	81
4.1 Purpose, Hypothesis, And Tasks Of The Study	81

4.2 Research Methods	82
4.3 The Investigated Sample And Study Organization	88
4.4 Analysis And Interpretation Of The Results	89
CONCLUSIONS.....	103
REFERENCES	105

FOREWORD

It is with particular interest that I introduce the work of Viorela Popescu, PhD, Lecturer at the Bucharest Academy of Economic Studies (Department of Physical Education and Sport), a study which brings to the attention of readers the significance of passive resting among young university students aged 18 to 20, in supporting the recovery of the body following sustained physical or intellectual exertion.

The aim of this book is to assess the level of awareness among students at AES regarding proper hygienic practices that contribute to the maintenance of optimal health and the improvement of physical condition. The empirical research is grounded in the central hypothesis that, despite nighttime sleep being the primary mode of recovery, students often do not attain adequate rest—neither in terms of duration nor quality. Although young students may be theoretically aware of the importance and role of rest after exertion, particularly through sleep, in practice they struggle to observe the recommended duration necessary for effective recovery. The author emphasizes that both the quantity and quality of sleep are vital for restoring the human body to an efficient and functional state.

I wholeheartedly recommend this work to academic staff, students, and the wider public alike, as it offers valuable insights into the principal methods and techniques employed in the recovery and restoration of health and performance capacity among those engaged in sports and physical activities.

Prof univ. dr. Cristiana-Lucreția Pop

*Chapter 1***The theory of recovery****1.1. The concept of recovery**

Recovery is a concept belonging to both physical education and sports activity, as an integral part of the same formative-competitive motor activity.

The content of the instructional-educational process is applied through didactic tools, which are introduced in physical education activities through the means employed in lessons. The tools selected by the teacher are performed by pupils or students during the instructional process.

The means of physical education are categorized into two groups:

- ⇒ Physical exercise - the operational tool that achieves the specific objectives of the field;
- ⇒ Equipment, installations, and specialist materials, which allow for more precise localization and control of segmental and whole-body movements;
- ⇒ Ways of restoring physical capacity, consisting of a series of direct operational tools targeting individuals who have exerted physical effort and experienced biological wear. Motor activity is supported by various systems that generate energy (in the form of effort), which results in the onset of fatigue (Sabău, E., 2006).

The effort exerted by individuals engaged in physical education is less intense than that which generates significant wear on the athlete's body due to training for high-level competitive performance.

In a physical education lesson, recovery of the students' organism occurs naturally and is spontaneously triggered once the exertion ceases.

According to I. Drăgan (2002), recovery constitutes an "indirect form of energetic preparation (recharging the energy stores) of the organism, depleted of fuel either through excessive energy consumption induced by exertion or through increased loss of biological agents."

Etymologically, the concept of recovery refers to restoration, return to a previous state, reinforcement, and revitalization. Its synonyms include biological regeneration, rebalancing, and reconditioning.

Recovery encompasses a set of rationally applied tools aiming to restore the internal equilibrium of the body's functional parameters to homeostatic levels (pre-exercise) and even surpass that threshold (supercompensation).

Recovery involves restructuring the body as a consequence of the exertions sustained during training. Its primary aim is to counteract fatigue and restore the biological balance of the athlete's body.

To meet the high demands of athletic performance, rapid recovery of the body is essential. This occurs in two phases or components:

The trophic phase is a component of sports training which, through natural or artificial means, restores the biological potential to its previous level (or even beyond it).

The ergotropic phase underpins the capacity to release energy under the demanding conditions of athletic exertion, training, and competition.

The spontaneous, natural return of biological parameters occurs over a period ranging from several minutes to several days and follows a specific sequence: first, the metabolic functional parameters; next, the hormonal ones; and finally, the enzymatic systems.

In high-performance sports training, where a weekly cycle may include 14–17 training sessions and daily effort may extend to 6–8 hours, natural biological recovery is no longer sufficient. Incomplete recovery can lead to states of overtraining and physical overload. To prevent such conditions, interventions are employed to accelerate physiological recovery.

Directed recovery comprises two chronological phases:

- ⇒ The biological reconstruction phase
- ⇒ The functional efficiency phase.

It is pivotal to emphasize that recovery, which addresses a healthy organism, must not be confused with rehabilitation, which refers to an organism affected by injury or trauma and requiring reconstruction of its morpho-functional integrity.

1.2 Principles of Recovery

A scientific theory is founded upon a set of core ideas, fundamental laws, or principles.

The theory and methodology of sports training and competition have evolved, leading to a more careful examination of recovery as a factor and component of athletic preparation. In this context, several laws have been formulated, which are upheld as guiding principles:

- ⇒ *Recovery of physical capacity is an substantial and integral part of the training process.* The contemporary approach to athletic preparation and the increased demands of competition and training have necessitated viewing recovery as a critical component of an athlete's development. The growing psychological and physical stress placed on athletes requires specific measures to ensure adequate recovery and sustain ongoing efforts.
- ⇒ *Recovery is a process intended for healthy athletes who have undergone strenuous physical and psychological*

effort that has impacted certain functional or biochemical parameters. Recovery is tailored to athletes who are physically or mentally fatigued after training or competition. It is an individualized process aimed at restoring work capacity after exertion, taking into account the sport discipline, the nature of the effort, training experience, fitness level, and age.

- ⇒ *Recovery is a natural process that begins spontaneously immediately after the cessation or reduction of effort parameters.* This is supported by the direct dependence of recovery on the central nervous and autonomic endocrine systems. As soon as effort ceases, the recovery process begins involuntarily. However, in certain situations – such as extremely high energy expenditure, special physiological states, or unusual external training/competition conditions – spontaneous recovery is insufficient, thus necessitating intervention to accelerate the process.
- ⇒ *Recovery of the physiological systems involved in sports exertion occurs in a specific sequence:* Initially, vital vegetative parameters (heart rate, respiratory rate, blood pressure) recover within 10–30 minutes. Metabolic parameters (e.g., glycogen levels post-exertion) are restored over several hours. Finally, the finer systems (enzymatic, redox, and neurohormonal) recover within 1–3 days. Physiological recovery is subordinate to the central nervous system (especially the cerebral cortex), which itself can only be restored after vegetative and metabolic parameters return to normal.
- ⇒ *Recovery is an individualized process shaped by the athlete's characteristics, including:*
 - ✓ Health and training status: Certain conditions or injuries may contraindicate specific recovery methods.

Elite athletes, especially after high-stakes competitions, require more complex recovery strategies, whereas beginners may benefit sufficiently from simpler, spontaneous recovery methods (e.g., sleep, nutrition).

- ✓ Discipline-specific effort: Recovery methods differ between anaerobic and aerobic exertion.
 - ✓ Age: Novice athletes often recover naturally, while elite athletes utilise complex, multidisciplinary recovery approaches.
 - ✓ Training period: Recovery tools must align with the objectives of each training phase and depend on the resources available in the athlete's environment. In transition phases, recovery strategies must be more diverse (e.g., spa treatments).
 - ✓ Timing of recovery implementation: Recovery can occur intra-effort (during training, between exercises or sessions) or post effort (after a micro cycle of 5-7 days, a training stage, or a full preparation cycle of 2-4 years).
 - ✓ The biological system most affected by exertion: Recovery strategies differ depending on the system most fatigued – for example, the methods used for a long-distance runner differ significantly from those for a gymnast or a throwing athlete.
- ⇒ *Recovery is a two-component process* essential for sustaining both training and competitive performance:
- ✓ The trophotropic component, which restores the organism's homeostasis and biological potential to its pre-training or pre-competition level.
 - ✓ The ergotropic component, which aims to “overload” the energy system, increasing the body's ability to