Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_1
UDC 612.662

QUANTITATIVE ASSESSMENT AND NOMENCLATURE OF THE MENSTRUAL CYCLE PHASES IN ATHLETES: ANALYSIS OF CLASSIFICATIONS

A.B. Miroshnikov, A.E. Anisimova
Russian University of Sport "GTSOLIFK", Moscow, Russia

Abstract. The menstrual cycle can influence the well-being and physical performance of elite female athletes. Objective – to analyze existing approaches to the classification of menstrual cycle phases in female athletes in the scientific literature, with an emphasis on the quantitative definition and nomenclature of the phases used. The study was conducted in two stages. Methods of the first stage: the literature search was carried out in accordance with the PRISMA-S and PRESS checklists. The literature search was performed in the PubMed database. The time frame of the search was 5 years. No language barrier was set. Methods of the second stage: the ACCORD guideline was used to ensure compliance with reporting rules between experts. Participants were recruited through purposive sampling, during which a group of experts was selected based on the criteria of knowledge of the issue. The search identified 63 references. A total of 12 studies met the inclusion criteria. The studies indicated from 2 to 7 menstrual cycle phases with different names. The experts' opinions mainly differed in their commitment to consider the ovarian cycle (n=7, 50%), the uterine cycle of the menstrual cycle (n=5, 35%), and a mixed variant (n=2, 15%). The need for further research in the field of the menstrual cycle is due to the lack of unanimity among experts regarding the number of phases and their names. Until a consensus is reached in the scientific community, the results of all studies including female participants should be interpreted with caution.
Keywords: menstrual cycle, ovarian hormones, estrogens, progesterone, sports.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_2
UDC 004.89

ANALYSIS OF THE FUNCTIONAL STATE OF ATHLETES AND NON-ATHLETES BY MACHINE LEARNING METHODS

R.M. Khusnutdinoff[1,2], A.M. Sitdikov[2], M.I. Galyautdinov[2], L.M. Akhmetshina[3,4]
[1]Kazan State Power Engineering University, Kazan, Russia
[2]Volga Region State University of Physical Culture, Sports and Tourism, Kazan, Russia
[3]Interregional Clinical Diagnostic Center, Kazan, Russia
[4]Zelenodolsk Central District Hospital, Zelenodolsk, Russia

Abstract. The aim of the study – a comparative analysis of the functional state of athletes and non-athletes using machine learning methods. The input factors were experimental data on the physiological parameters and characteristics of the subjects obtained at the research center of the Volga Region State University of Physical Culture, Sport and Tourism. The selection of significant factors was carried out using the principal component analysis method. A detailed analysis of the experimental data was performed using artificial neural network and random forest models, for which optimal configurations and hyperparameter values were found. It was found that both methods allow identifying athletes and non-athletes by their physiological parameters and characteristics with a high degree of probability (over 90%).
Keywords: principal component analysis, artificial neural network, random forest method, functional state.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_3
UDC 615.838

LANDSCAPE AND CLIMATIC POTENTIAL OF PYATIGORSK AS A FACTOR ENSURING EFFICIENCY OF SANATORIUM-RESORT TREATMENT, TOURISM AND RECREATION

Yu.V. Koryagina, A.P. Tychinina, V.V. Korneva, O.N. Akimkina
FSBI "North-Caucasian Federal Research-Clinical Center of Federal Medical and Biological Agency", Essentuki, Russia

Abstract. The article is dedicated to a comprehensive study of landscape and climatic potential of Pyatigorsk using the example of microclimate indices of the S.M. Kirov Sanatorium, the Pyatigorsk Clinic and the Rodnik Sanatorium territory. Materials for the research included guiding documents, GOSTs, state reports, scientific papers and results of traversing. The conducted analysis has shown that values of the microclimate indices range within the standard. High level of light negative air ions and oxygen content, humidity, low level of carbon dioxide gas and aerosol particles in the air of the studied area have a favorable effect on a human body. A large amount of vegetation on the territories of sanatoria and the city as a whole provide great opportunities for efficient sanatorium-resort treatment, tourism and recreation.
Keywords: Pyatigorsk, climate, landscape and climatic potential, bioclimate, sanatorium-resort treatment, tourism, recreation.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_4
UDC 769.922; 612.062

THE AEROBIC EXERCISE EFFECT ON THE FUNCTIONAL STATE OF ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS

V.V. Kostyaeva
Russian University of Sport "GTSOLIFK", Moscow, Russia

Abstract. Aerobic exercises are increasingly being included in the rehabilitation process to improve the functional state of the main body systems. Objective: to evaluate the effect of aerobic training on the functional capabilities of adolescents with idiopathic scoliosis. Methods: 6-minute walking test with an assessment of physical activity on the Baseline Dyspnea Index scale; spirometry; heart rate; determination of resistance to hypoxia. The indicators of external respiration (9.1%), general endurance (16.1%) and adaptive reserves of the body (3.2%) of adolescents improved. the improvement of functional capabilities was achieved with moderate physical exertion and a lower respiratory rate (16.4 breaths/min). Aerobic exercise increases the adaptive capabilities of the body and improves the functional performance of children suffering from musculoskeletal system pathologies.
Keywords: idiopathic scoliosis, correction, functional disorders, aerobic exercise, spinal stabilization.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_5
UDC 769.922; 612.062

HYDROKINESITHERAPY FOR CHRONIC LOW BACK PAIN IN BALLET DANCERS

V.V. Kostyaeva, N.A. Chulyukova
Russian University of Sport "GTSOLIFK", Moscow, Russia

Abstract. Chronic pain in the lumbar spine is a manifestation of pathologies of the musculoskeletal system. For classical ballet dancers, this problem can become a serious obstacle, often leading to disability and, as a result, to the cessation of professional activities. Currently, there are many generally recognized rehabilitation methods, one of which is hydrokinesitherapy. Objective of the study: to evaluate the effectiveness of hydrokinesitherapy for chronic pain in the lumbar spine in ballet dancers. Methods: assessment of pain intensity and impaired vital activity; assessment of health-related quality of life; determination of functional mobility and flexibility in the lower spine. Hydrokinetic therapy reduced pain intensity (26.3%); improved physical (14.8%) and mental (11.3%) health of dancers; increased functional mobility (8.9%) and flexibility (7.4%) in the lumbar spine. Hydrokinesitherapy can be considered as an effective and safe therapy for patients with chronic pain in the lumbar spine. This approach helps to relieve pain, improve the quality of life and the functional capabilities of patients.
Keywords: hydrokinesitherapy, rehabilitation, physiotherapy, chronic pain, physical limitations.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_6
UDC 376.2

DYNAMICS OF KNEE JOINT FUNCTIONALITY AFTER ARTHROSCOPY IN THE RECOVERY PERIOD WITH THE USE OF PHYSICAL THERAPY MEANS

A.Sh. Yagibekova[1], N.V. Lunina[1,2]
[1]Russian University of Sport "GTSOLIFK", Moscow, Russia
[2]FSBI "North-Caucasian Federal Research-Clinical Center of Federal Medical and Biological Agency", Essentuki, Russia

Abstract. The article considers the dynamics of the knee joint functionality after arthroscopy in the recovery period using physical therapy means. The duration of the physical therapy course aimed at restoring the knee joint functionality after arthroscopy in the recovery period was 3 months. The following were used: therapeutic gymnastics, mechanotherapy, sessions with training devices, hydrokinesitherapy, massage, physiotherapy (cryotherapy, magnet therapy), proprioceptive gymnastics, kinesio taping of the knee joint. The total amount of rehabilitation sessions was 3-5 times a week with a duration of 60-90 minutes. The dynamics of the damaged knee joint functionality after arthroscopy is reflected in reliable improvements of the studied indices: the range of motion in the knee joint according to the goniometry data increased by 38.7% in flexion and by 126.2% in extension; the strength of the quadriceps femoris muscle of the thigh of the operated lower limb increased (according to the dynamometry data) by 77.2%; the functional state of the knee joint according to the Lysholm scale improved by 46.8%; the intensity of the pain syndrome according to the visual analogue scale decreased by 76.1%. The presented results reflect the positive changes in the knee joint functionality after arthroscopy in the recovery period with the use of physical therapy means.
Keywords: functionality, knee joint, meniscus, arthroscopy, physical therapy means.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_7
UDC 796.08

OVERVIEW OF SCIENTIFIC RESEARCH ON PHYGITAL SPORTS

V.A. Beresneva[1,2], N.S. Skarzhinskij[2]
[1]Sports and Methodological Center "Department of eSports", Moscow, Russia
[2]Synergy University, Moscow, Russia

Abstract. Objective of the study – to identify main directions of research on phygital sports and justify topics of prospective scientific works. The article provides a retrospective analysis of scientific articles on phygital sports on the eLibrary platform. 469 publications were studied, which allowed us to identify the main areas of research. Scientific research on phygital sports are of increasing significance in a context of rapid digital transformation of various fields of society, including sports. The greatest attention is paid to the integration of phygital sports into the educational environment, conceptual understanding of it as a phenomenon of digital transformation of sports, as well as comparison with esports. It has been revealed that the issues of sports training of phygital athletes and the effect of hybrid activity on the physiological parameters of phygital athletes have not been studied at the present time.
Keywords: phygital sports, phygital movement, sports, sports training, phygital.

Publication date: 15.03.2025
DOI: 10.24412/2782-6570-2025_04_01_8
UDC 796

PROBLEMS OF INTEGRALITY OF SPORTS TRAINING THEORY: BLOCK PERIODIZATION VERSUS TRADITIONAL SPORTS TRAINING THEORY

A. Petrovic, V. Koprivica
University "Union – Nikola Tesla", Belgrade, Serbia

Abstract. The main problem of this research was to find an answer to the question whether the theoretical assumptions related to the structure of sports training (principle relationship between microcycle, mesocycle and macrocycle) in traditional sports training theory are of a subjective/mechanical or objective/integral character. The aim of this research is to show the essence of the principle relationship between microcycle, mesocycle and macrocycle in sports training. Authors of the block periodization theory of sports training vigorously opposed the traditional sports training theory and pointed out that it has no objective scientific basis. Is that a justified claim that the timely integration of the effects of the microcycle, mesocycle and macrocycle of sports training explains the sporting form? The basic assumptions of traditional sports training theory are based on objective scientific knowledge of an integral character, and not on the subjective and mechanical division of the training process.
Keywords*:* load, adaptation, training effects, sporting form, macrocycle, periodization.