Book of Abstracts

5th World Scientific Congress

"Quality of Life in Interdisciplinary Approach"

Kochcice, Poland 2024

Editors
Jacek Wąsik, Dorota Ortenburger

Book of Abstracts

These are the original abstracts submitted to 5rd World Scientific Congress “Quality of Life in Interdisciplinary Approach”, Kochcice, Poland, November 6-8, 2024

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Dear Colleagues and Friends

We are thrilled to welcome you to Kochcice, near Częstochowa, for the 5th World Scientific Congress on "Quality of Life in an Interdisciplinary Approach," held in Poland from November 6-8, 2024. This year's Congress has shown that, despite global challenges, we have successfully gathered a diverse, multidisciplinary group of researchers and practitioners.

Participants from 12 countries: United Kingdom, Germany, China, Czech Republic, Slovakia, Ukraine, Uzbekistan, Turkey, Switzerland, Sweden, Italy, and Poland, representing 39 research institutions, are attending this event.

This Congress offers a valuable platform for cross-disciplinary communication and sharing of expertise. As organizers, we aim for this gathering to foster discussions and stimulate collaborative research initiatives.

Wishing you all the best for your presentations!

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Programme

6 November 2024, Wednesday	
From 14.00	Arrival, accommodation - Strzelnica Family Resort & SPA, ul. Lubliniecka 9, Kochcice, 42-713 Kochanowice
15.30 – 17.30	Social program, Sauna, SPA
18.00 – 19.30	Dinner
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ABSTRACTS

Attractor Reconstruction: A Novel Approach to Evaluating Movement Technique in Sports

Michalina Błażkiewicz-Janeczko

Department of Rehabilitation, The Józef Piłsudski University of Physical Education in Warsaw, Poland

Introduction: Recently, nonlinear dynamical systems theory has emerged as an important tool for studying the complexity of athletic performance. Traditionally, methods for evaluating movement techniques in sports have relied on deterministic, repetitive measures. However, human movement is inherently nonlinear and dynamic, making conventional methods insufficient for capturing the full range of variability in performance. Techniques such as attractor reconstruction and recurrence quantification analysis (RQA) allow for a more nuanced understanding of the stability and variability of movement patterns. In this study, a novel approach was proposed to quantify and compare the dynamical control strategies of athletes across different sports using measures of dispersion, persistence, and recurrence.
Material and methods: The study recruited elite and novice athletes from dance and archery, tracking movement kinematics (pirouette, archery draw) with a 3D motion capture system. Time series data were reconstructed into phase space, with optimal delay and embedding dimension determined by mutual information and the false nearest neighbor method. RQA was used to further analyse the dynamic patterns in the reconstructed phase spaces. Key RQA metrics (recurrence rate, determinism, and entropy), were calculated to quantify the stability and complexity of the movements. These metrics allow for comparing how frequently and predictably a system revisits particular states in its phase space. The Hurst exponent was calculated to assess whether athletes movement time series showed persistent trends or frequent corrections. The Lyapunov exponent was used to assess chaotic behavior and sensitivity to initial conditions.
Results: Elite athletes exhibit more compact attractor geometries, higher recurrence rates, and less persistent dynamics, reflecting tighter and more fluid control over their movements. In contrast, novices display greater variability and less predictability in their movement trajectories.
Conclusions: This study demonstrates that attractor reconstruction and RQA offer powerful tools for evaluating movement techniques in sports. These findings highlight the potential for dynamical systems analysis to quantify expertise in sports and provide new metrics for evaluating and improving athletic performance.

Keywords: phase space, dance, pirouette, archery

Acknowledgment: This work was conducted as part of UPB Project No. 2.

The impact of military events on the general condition of elite athletes

Georgiy Korobeynikov[12], Lesia Korobeinikova[12], Ivanna Korobeinikova[34]

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Introduction: The current stage of human development is characterized by the emergence of new risks and military conflicts. One of the large-scale ones is Russias military aggression against Ukraine. Negative consequences of the war can be mental disorders and post-traumatic stress in the civilian population. Some authors point to an increase in anxiety and distress among the population of Ukraine over the past two years. However, in the conditions of war, Ukrainian athletes continue to participate in competitions. Our previous study showed that athletes have special mechanisms for adapting mental prevention in war conditions. Purpose to study the consequences of the influence of military events on the general condition of elite athletes.
Material and methods: 21 elite fencers (18-24 years old) and 19 elite Greco-Roman wrestlers (20-27 years old), members of the Ukrainian National Team, were examined. Mental state, cognitive and neurodynamic properties were studied. The study is carried out within six months from the moment of military aggression.
Results: The study showed that fencers and wrestlers showed a predominance of mental stress for six months. This result was consistent with mental fatigue in elite athletes. At this time, the wrestlers showed a tendency towards mental isolation. Cognitive characteristics indicate a decrease in the ability to perceive and process information in fencers six months after the start of
the war. The wrestlers showed slowness and quality of decision-making in response to environmental stimuli. One of the specific reactions to the military situation among elite athletes
was the predominance of processes of excitation of the nervous system. But our study revealed a
high level of stress resistance in elite athletes. The obtained fact indicates the manifestation of
compensatory adaptation mechanisms that make it possible to prevent the consequences of post-traumatic disorders associated with war.
Conclusions: Six months after the start of military aggression, manifestations of states of
mental stress were noted in elite athletes. This process is accompanied by a decrease in stress
resistance in athletes.

Keywords: war, fencers, wrestlers, general condition

Resilience for better life quality during the war: Ukrainian case

Iuliia Pavlova

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Introduction: The Russian invasion of Ukraine, which began on 24 February 2022, has been accompanied by horrific losses among civilians. This study is focused on children and youth, who make up one fourth of the population of Ukraine, respectively their level of well-being reflects the well-being of the entire country as in short-term and long-term perspective. The study concentrates on positive resources and experiences that support resilience and optimal functioning of young people in the war conditions, but at the same time we do not deny or avoid evaluating negative experiences and traumas.
Material and methods: A total sample of 1 455 respondents aged 17–24 years participated in the study. Direct exposure to bomb explosions was experienced by 45% of youth, 6% of participants were hospitalized for war injuries, 41% had relatives hospitalized or dying during the war. The survey included standardized techniques for assessing well-being, various aspects of mental health, physical functioning, post-traumatic growth and resilience, and more.
Results: The war-related PTSD symptoms were presented in 27% of participants. Every third respondent (31.3 %) noted a decrease in interest in daily affairs, avoidance of thoughts or activities associated with traumatic or painful experiences, inability to remember details of the most traumatic events, and nightmares were the least common among all surveyed respondents. More than 50% of respondents have post-traumatic growth. Women showed significantly higher than man level PTSD symptoms. The level of posttraumatic growth and life satisfaction were also higher for women, while the resilience, and coping strategies did not differ.
Conclusions: Our research reveals the influence of socio-demographic and war-related factors (proximity of residence to active hostilities, change of residence due to war, etc.) on aspects of resilience and post-traumatic growth, in particular, acceleration of the processes of adaptability and resilience, which at the same time goes hand in hand with the aggravation of problems with mental health. The introduction of new technologies that will allow to cover large groups of the population and allow to identify risk groups seems necessary.

Keywords: youth, mental health, quality of life, post-traumatic growth.

Unraveling Lactate and Fatigue Dynamics in Elite Taekwondo Athletes During the 30-Second Continuous Jump

Mehmet Zeki Kaya, Seyed Houtan Shahidi

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This study investigates the intricate lactate kinetics and performance decrements experienced during a 30-second BOSCO jump protocol in elite Taekwondo athletes, providing a comprehensive understanding of anaerobic performance and recovery dynamics. Anthropometric data, including age, height, and weight were collected for all athletes to contextualize the findings. The athletes had an average age of 21.2 years (± 2.0 years), an average height of 181.4 cm (± 4.8 cm), and an average weight of 70.6 kg (± 4.3 kg). Jump heights, contact times, and power outputs were meticulously measured using the Witty jump mat device (Italy) during the first and last 5 seconds of the 30-second protocol to assess fatigue-induced changes. Blood lactate concentrations were obtained with the Lactate Scout 4 (Germany) before and immediately after the protocol, as well as at 3, 6, and 9 minutes post-exercise, providing valuable insights into metabolic responses. Results revealed a significant decrease in jump height (mean decrease = 13%, 95% CI: 8% to 18%, p = 0.01) and power output (mean decrease = 15%, 95% CI: 10% to 20%, p = 0.02), along with an increase in contact time (mean increase = 18%, 95% CI: 12% to 24%, p = 0.03) from the first to the last 5 seconds, underscoring the pronounced impact of fatigue on explosive performance. On average, jump height decreased by 13% (± 6%, 95% CI: 8% to 18%, p = 0.01), while similar trends were observed in power output (mean decrease = 15%, 95% CI: 10% to 20%, p = 0.02) and contact times (mean increase = 18%, 95% CI: 12% to 24%, p = 0.03). The highest reduction in jump height ("Fatigue Jump Height") was observed in Athlete B (31.36%), highlighting substantial inter-individual variability in fatigue resilience. Blood lactate levels surged significantly from baseline (mean = 0.78 ± 0.08 mmol/L, 95% CI: 0.70 to 0.86 mmol/L) to peak values post-exercise (mean = 3.16 ± 1.19 mmol/L, 95% CI: 2.80 to 3.52 mmol/L, p < 0.001), followed by a gradual decline during recovery. Lactate clearance rates were calculated as the percentage decrease in lactate levels over time. On average, lactate levels decreased by 40.5% from peak to 3 minutes post-exercise, 60.5% from peak to 6 minutes post-exercise, and 65.5% from peak to 9 minutes post-exercise. Despite comparable initial lactate levels, notable differences emerged in lactate clearance rates, with Athlete D exhibiting the fastest clearance (with a rate of 72% from peak to 9 minutes, 95% CI: 65% to 79%, p = 0.02) and Athlete C showing the highest lactate values at 6 and 9 minutes post-exercise, indicating marked variability in metabolic recovery capacities. The findings underscore that elite Taekwondo athletes undergo substantial fatigue and lactate accumulation during the 30-second BOSCO jump, emphasizing the need for tailored conditioning programs to enhance anaerobic performance and optimize lactate clearance. The observed inter-individual differences in physical and metabolic responses highlight the relationship between anthropometric profiles, fatigue resistance, and recovery kinetics in Taekwondo athletes. The need for individualized training interventions becomes crucial to enhance competitive performance by addressing both physical characteristics and metabolic resilience. Future research should explore the influence of targeted conditioning on anaerobic capacity, recovery kinetics, and overall athletic performance in elite combat athletes.

Computer program for development of tactical thinking in soccers players

Otabek Khasanov, Zakhid Gapparov, Georgiy Korobeynikov, LesiaKorobeinikova, Javlon Ishtayev

Uzbek State University of Physical Education and Sport, Chirchik, Uzbekistan

Introduction. This article examines the ability of young soccer players to quickly and accurately make decisions in various tactical actions encountered in the game, as well as remember all the studied combinations. These abilities are developed in traditional training. Also, another aspect is psychological readiness for implementation in the game. Purpose: explore the possibilities of using a computer program to develop the tactical thinking of soccer players.
Material and methods At the present stage, the development of tactical skills of young players is one of the pressing problems. To achieve high results by youth and junior national teams, it is necessary to further strengthen the effectiveness of the training system. For this purpose, we have proposed an effective computer program called "TACTIK". The presented program called "TACTIC", developed by us, develops memory, thinking, and the ability to make quick and accurate decisions in young football players.
Results: At the beginning of the study, the average time for athletes to solve tactical problems was 17.54 seconds. According to the results of the study, the average time for solving tactical problems was 9.29 seconds. The difference in the reduced time at the beginning of the study and at the end was 8.25 seconds. The number of errors when performing tasks to perform tactical combinations at the beginning of the study was 61, at the end - 6. The total number of errors was decreased by 55. The goal of the program is to further develop players' ability to memorize tactical combinations. The more tactical combinations players can remember and implement effectively, the better the outcome of the game.
Conclusions: At each training session, soccer players are taught different tactical combinations, taking into account their age characteristics, but the speed of thinking and accuracy of decision- making in competition conditions is an important task when training young football players.

Keywords: "TACTICS", soccer players, tactical actions, decision making.

Scientific Innovations in Sports Practice and Their Impact on Medal Rankings at the 2024 Paris Olympic and Paralympic Games

Viktoriia Nagorna[1,2], Artur Mytko[1,2], Silvio R. Lorenzetti[3]

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Introduction: This study investigates the impact of scientific innovations in sports practice on the medal rankings of countries participating in the 2024 Paris Olympic and Paralympic Games, focusing on inclusivity and gender equality. Scientific advancements are reshaping sports science, providing valuable insights that enhance training strategies and athletic performance.
Materials and Methods: A multistage approach was employed to collect data, utilizing bibliometric methods from databases such as Scopus, Web of Science, and Google Scholar. Artificial Intelligence tools, including perplexity.ai, were integrated to ensure data precision. Pearson correlation analysis was conducted to examine the relationship between top sports science countries and their 2024 Olympic medal rankings, particularly emphasizing female athletes' performance ($p < 0.05$). Custom Python scripts were used to compute and visualize correlation coefficients.
Results: The analysis shows a positive correlation between countries excelling in sports science and higher medal counts. Countries with strong sports science infrastructures, such as the U.S. and Australia, outperformed others, particularly in female athlete achievements. The results highlight the crucial role of gender-specific sports science in enhancing competitive success. This study also emphasizes the need for audience support in promoting gender equality.
Conclusions: There is a clear correlation ($r=0.78$, $p < 0.05$) between advanced sports science and Olympic success. Countries like the U.S. and Australia excel due to their robust sports science programs, especially in promoting gender equality. However, challenges remain for some countries, such as the UK, which, despite advanced research, struggle to convert it into Olympic success. These findings suggest that a comprehensive approach combining sports science, governmental support, and gender-focused policies is essential for sustained competitive success in global sports.

Keywords: sports science, Olympic Games, Paralympic Games, gender equality, inclusivity, scientific innovation

Efficiency of explosive ability development in young weightlifters using the SPORK device

Javlon Ishtayev, Zakhid Gapparov, Georgiy Korobeynikov, Lesia Korobeinikova, Otabek Khasanov

Uzbekistan State University of Physical Education and Sport

Introduction Increasing the weight of the projectile provokes an improvement in explosive power in a weightlifter. In this regard, the development of explosive psychomotor qualities in an athlete should constantly outpace the next training weight of the barbell. That is why a stating experiment was conducted to develop this quality of a weightlifter.
Materials and methods The SPORK approaches were used to study explosive strength. This equipment is a special device attached to a wall bar. 100 weightlifters were examined, including 40 elite athletes and 60 young athletes.
Results The results of the research on the development of psychomotor skills of explosive power in weightlifters of various sports qualifications showed an increase in the results of jumps in athletes associated with the use of a special device. The results obtained indicate: before training, the jump height was 54.3 cm, and after the training process - 60.2 cm. This indicates the reliability of the approach used in the preparation of weightlifters. According to our research, the SPORK device helps develop some properties that support the effectiveness of weightlifters. The first property is setting a training goal. This is very important for young athletes. The next characteristic is concentration of attention on the goal. This parameter includes a number of factors: concentration of muscle effort, motivation and conditions for reverse afferentation. The results of studies on the development of explosive psychomotor skills and their impact on the athletic performance of weightlifters showed that a positive effect can only be noted in elite athletes.
Conclusions It has been established that in various weight categories there is a direct connection between the magnitude of explosive psychomotor qualities and the competitive result. Athletes with a high level of explosive psychomotor qualities achieve greater success.

Keywords: SPORK, weightlifter, explosive psychomotor, motivation, concentration

The Development of School Physical Education and the Education of School Physical Education Teachers in the Czech Lands from the Beginning to 1953

Tereza Fajfrlíková

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University of West Bohemia in Pilsen, Faculty of Education

This research focuses on the development of education for school physical education teachers in the Czech lands from the beginning until 1953. The introduction briefly summarizes the current state of school physical education in the Czech Republic. The paper then addresses the history of teacher education in school physical education in relation to the overall development of school physical education in the Czech lands. The year 1953 holds significant historical importance for physical education and sport, as on April 7, 1953, a government resolution established an independent university — the Institute of Physical Education and Sport. Physical education has had, and continues to have, important political, educational, and economic roles. Our school and organizational physical education belonged to one of the leading and well-functioning systems in Europe. Given the current discussions about a new approach to school physical education in the Czech Republic and the development of the Strategy 2030+, we consider it essential to focus on this period. Historical knowledge has value in itself, but the most recent history is connected to the present and can be inspiring in many ways. The primary method used in the creation of this paper was content analysis of available academic literature, school curricula and laws, academic articles, and archival materials.

Keywords: school physical education, educational institutions, Institute of School Physical Education and Sport (1953)

Behaviour problems and co-occurring developmental conditions: genes, environments and their interplay

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Individual differences in developmental phenotypes are influenced by complex genetic and environmental factors, as well as their interplay. Here we aimed to investigate the genetic and environmental aetiology of child and adolescent neurodevelopmental phenotypes. We focused on the polygenic prediction of behaviour problem symptomatology and identifying environmental conditions that combine with genetic propensity to result in individual variation in behavioural traits. Longitudinal phenotypes and DNA data came from the Twins Early Development Study sample, consisting of more than 10,000 twin pairs born in England and Wales. Our analyses showed that neurodevelopmental disorders in childhood and adolescence are highly heritable, and their pattern of co-occurrence is complex— while some are closely related, other show little genetic overlap, along with moderate-to-strong overlap with other developmental conditions. Research into polygenic prediction revealed modest predictive power of polygenic scores, accounting for up to 5% of the variance in child and adolescent behaviour problems and suggested that DNA-based prediction models can explain more variance by employing cross-trait, longitudinal and trans-situational approaches, and by using multiple polygenic scores to predict developmentally aggregated measures. In the search for specific early environments that predict behaviour problem outcomes, preschool, primary, and secondary school environments were not observed to have a major environmental impact, the strongest predictive processes were genetic. These insights laid the foundation for analysing how genes and environments correlate and interact in shaping adolescent psychopathology, revealing that both contribute to its development, though their interactions are modest. We provided evidence to inform clinical and educational procedures and practice, as well as discussed strategies to improve prediction of behaviour problems and developmental psychopathology.

Keywords: neurodevelopment, behaviour problems, polygenic scores, heritability, twin study

An implantable scaffold as a network chamber for in vitro sensitized Antigen Presenting Cells (APCs) - immunological consequences of cell-to-cell contact with naive PBMCs in the cell culture

Iwona Ewa Kochanowska[12], Miriam Tomczak[2]

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Developing a safe and reproducible technique for transmitting immune information between extracorporeally sensitized immune cells and naive immune cells in cell culture with scaffolds will allow to use of these scaffolds as a carrier. The main aim of the work was an elaboration on the favorable conditions for cell-to- cell contact in a biocompatible, implantable scaffold. In the first stage, the mouse spleen cells, identical to the PBMC population (Peripheral Blood Mononuclear Population) were immunized in vitro with modified polypeptide fragments of ovalbumin (OVA) as well as with whole protein molecules. Chicken OVA is an antigen possessing strong and dependable antigenicity. It is also non-toxic and also inert for animals. Usually, murine T cell response and anti-OVA antibodies are detectable 8-10 days after immunization. The research was divided into stages, but all of them led to achieving the main target i.e. detection of some antigen-specific changes in the recipient immune system including specific antibody generation, B memory cells appearance, or lymphocyte T activation taking place in blood, spleen, or thymus. Firstly, the parameters of the successful antigen-pulsing (Ag-pulsing) of mouse blood peripheral mononuclear cells (PBMC) procedure in vitro were established. After that the in vivo Ag-sensitized cells were encapsulated in the scaffold and placed in a culture containing similar, naive cells. The potential immune results were looking in the post-culture medium as well as in the cell populations surrounding the scaffold. The successful cell-to-cell contact in cell culture manifests in cytokine secretion and/or specific antibody production. The development of such a method will allow for introducing information about the immunogen into the recipient's immune system without its direct immunization. In this method, the complete or inactivated pathogens could be used for obtaining multivalent resistance without the risk of patient disease or death. It could give safety insurance in cases of people excluded from the vaccination process for medical reasons like asplenia of different origins or anti-cancer treatment with cytostatic.

Keywords: immune cells, in vitro immunisation, implantable scaffold

Biomechanical analysis of punch force and hand velocity across 8 boxing techniques in orthodox and southpaw stances

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Introduction: Boxing performance significantly relies on the ability to deliver quick and powerful punches. This study aimed to analyze punch force and hand velocity among a group of young Olympic boxers executing eight common boxing techniques in both orthodox and southpaw stances. The research sought to answer how punch force and hand velocity differ between techniques and stances in adolescent athletes.
Materials and Methods: The research group consisted of six male Olympic boxers aged 15-17, each with at least one year of training experience. All participants were injury-free and in optimal physical condition. A force plate (AMTI model MC12-2K) was used to measure punch force, capable of measuring up to 8900 N. Punch velocity was recorded using a Noraxon Ultium accelerometer system, synchronized with cameras and dedicated Noraxon software for accurate movement tracking. Each athlete performed five strikes for each of the eight techniques in both orthodox and southpaw stances: jab, cross, lead hook, and rear hook. The average punch force and hand velocity were recorded for each technique.
Conclusions: This study underscores the importance of stance and technique in optimizing punching power and speed. The orthodox stance appears slightly more efficient for generating both force and velocity in young boxers. Further research with a larger group and longer training duration is recommended to enhance understanding of these dynamics across different skill levels.

Keywords: punch force, hand velocity, boxing, orthodox and southpaw stances, biomechanical Analysis

Innovative methods of supporting the process of breast cancer treatment with the support of VR and AL technologies

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The issue of breast cancer is an important issue not limited to the plane of medical science, but also finds a correlation with interdisciplinary fields such as computer science and technological engineering. Numerous scientific studies prove that the mental state of the patient has a considerable impact on the recovery process. VR and AL technologies make it possible to provide support at three key stages of the disease, in the post-diagnosis phase, during treatment (including radiation therapy and surgery) as well as mitigating post-treatment side effects and assisting during recovery. In recent years, we can note an increase in interest in terms of assisting medicine with modern technologies, especially in aspects of striving to improve the well-being and psychological well-being of people suffering from chronic diseases. The purpose of the presentation is to show the possibility of supporting women affected by cancer with devices that work with augmented and virtual reality. The author presents the results of a survey conducted among three organizations of women diagnosed with breast cancer. The speaker discerns the possibilities of adapting the methods presented by foreign research centers in the domestic medical and legal system, and discusses conclusions and proposals for improving medical procedures for the coming years.

Keywords: cancer, medical technologies, innovative methods

The Relationship Between Equestrian Experience and Postural Stability

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Introduction: Horse riding is an activity that necessitates continuous postural adjustments to maintain balance atop a moving horse. This constant engagement of the body's balance mechanisms may lead to improved postural stability in riders over time. Understanding how horse-riding experience affects balance could provide insights into the benefits of equestrian activities on postural control. This study aims to evaluate the impact of different levels of horse-riding experience on postural stability
Results: Significant negative correlations were found between riding experience and stabilographic parameters in both eyes-open (EO) and eyes-closed (EC) conditions, with Spearman's rho ranging from –0.26 to –0.39 ($P < 0.015$). One-way ANOVA revealed that in the EO condition, significant group differences existed for total sway length ($P = 0.048$), M/L amplitude ($P = 0.041$), and M/L velocity ($P = 0.025$). In the EC condition, significant differences between groups were observed in A/P amplitude ($P = 0.022$), M/L standard deviation ($P = 0.032$), M/L amplitude ($P = 0.037$), and M/L velocity ($P = 0.018$). These findings indicate reduced postural stability in less experienced riders.
Conclusion: Horse riding experience is significantly associated with enhanced postural stability among riders. The study found that increased riding experience correlates with reduced CoP movements and sway parameters, particularly in the mediolateral direction, under both eyes-open and eyes-closed conditions. These results suggest that prolonged engagement in horse riding improves balance and postural control, highlighting the potential of horse riding as an effective activity for developing postural stability.

Keywords: experience; postural stability; balance; center of pressure; equestrian riders

Long-term effect of an aerobic training program on body fat percentage in 10-12 year old swimming girls

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The aim of this study was to assess the effect of a three-year swimming training program on the percentage of body fat in adolescent girls, without prior pre-selection.
Method: Two groups of 10-year-old girls were analyzed at the beginning of the study. The experimental group consisted of 14 swimmers (body mass: 34.99 ± 2.77 kg; height: 146.00 ± 3.05 cm). The control group consisted of girls (body mass: 37.93 ± 6.02 kg; height: 145.55 ± 3.88 cm) who participated only in compulsory physical education classes. The study was conducted over a three-year period, with measurements taken every six months. Body fat was measured by skinfold thickness at four anatomical sites: above the biceps; above the triceps; below the inferior angle of the scapula; and above the superior iliac crest. Based on these measurements, the percentage of body fat was calculated.
Results: Statistical analysis revealed that despite the lack of initial selection, there was no significant difference in the percentage of body fat between the experimental and control groups at the start of the study (18.62% vs 24.85%). This difference persisted until the final measurement after three years, at which point it became statistically significant (17.31% vs 27.14%).
Discussion: Our findings indicate that three years of swimming training in pubertal girls led to reduced increases in body fat at all four measurement sites. The authors assume that the swimming training initiated in the group of swimmers, focused on endurance tasks, led over time to the swimmers achieving a body build corresponding to the characteristics of this sport and, consequently, to a reduction in adipose tissue, which had less and less impact on aerobic capacity.

Keywords: swimmers, girls, longitudinal study, body fat

Dynamic Balance Assessment Using Modified Version of the One Leg Jump Test for Taekwon-do Athletes

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Introduction: Dynamic balance is closely related to maximal strength performance, especially in Taekwondo. This study aims to investigate differences in dynamic balance assessments among Taekwondo athletes by comparing the standard One Leg Jump Test with a modified sport-specific version. The goal is to determine whether the adapted test offers a more sensitive and accurate reflection of the athletes' dynamic balance abilities.
Materials and Methods: A total of 20 Taekwon-do athletes, including 8 women and 12 men (mean age: 30.61 years), participated in the study. All participants had at least 2 years of experience. The athletes performed both the standard and modified versions of the One Leg Jump Test, which emphasized stronger support footwork. The modified test involved performing a roundhouse kick (Dollyo Chagi) during the jump. Each athlete completed both versions twice before and twice after a standard training session to assess repeatability and reliability.
Results: The athletes achieved an average of 4.12 meters for the right limb and 4.05 meters for the left limb in the standard One Leg Jump Test. In the modified version, the results were significantly lower, with averages of 2.24 meters for the right limb and 2.25 meters for the left limb. The modified test exhibited higher diagnostic sensitivity, with 39% of participants showing improvement post-training, compared to just 11% for the standard version. Moreover, the modified test demonstrated a small but positive average improvement, while the standard test showed a negative trend in post-training performance. The modified version also had lower standard deviations (0.16 to 0.28) than the standard test (0.50 to 0.60), indicating greater precision and repeatability.
Conclusions: The modified One Leg Jump Test offers a more sensitive and accurate assessment of dynamic balance in Taekwondo athletes compared to the standard version. Despite the lower distances recorded in the modified test, it demonstrated better diagnostic sensitivity and repeatability, making it a more effective tool for assessing dynamic balance in this sport.

Keywords: dynamic balance, martial arts, test validity

Physical activity as an element of patient wellbeing in the opinion of nursing students

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Physical activity is an essential element of human wellbeing. Any activity builds immunity and body efficiency, serves to prevent diseases and strengthens mental health. Physical activity is an indicator of a healthy lifestyle and its quality. Research confirms the importance of broadly understood movement in the prevention, treatment and rehabilitation of patients with various types of diseases, including disabilities. The holistic concept of health provides for an individual approach to diagnostics, treatment and medical care. The aim of this article is to answer the question: Are young people preparing to work with patients aware of the role of physical activity in the treatment process? Will they use this knowledge in practice as future healthcare workers?

Keywords: Physical activity, lifestyle, health, students.

Modern technologies for the neuromuscular system readaptation in students with hypokinesia

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Introduction: Insufficient physical activity or its absence is the main factor for developing hypokinesia in students. The low level of their body's resistance to a stressful physical stimulus leads to the activation of maladaptation associated with decreasing functional capabilities. The absence of an integrated mechanism for assessing the initial adaptive reserves of students with hypokinesia and informative markers complicates the neuromuscular system readaptation. The imperfection of the physical education system at universities only complicates this process. Modern researchers, using innovative health-improving training programs and a wide range of control methods, are looking for effective ways to solve the problem of hypokinesia. However, the effectiveness of using power fitness regimes during the neuromuscular system re-adaptation of students with hypokinesia has not been studied.
Material and methods: The study involved 150 students with hypokinesia aged 19 0.2 years. Two groups were formed. The duration of the research was 5 months. Representatives of group 1 used a general program of physical education for universities. Students of group 2 used power fitness models with moderate intensity (R a =0.65) mode. The maladaptation control was carried out using the following methods: bioimpedancemetry, heart rate variability, and biochemical blood test.
Results: The study showed that students with hypokinesia did not experience significant adaptation changes over 5 months of using standard physical education training programs. However, applying power fitness models increased students' fat-free and active body mass. The balance of vagus-sympathetic tone mechanisms was observed. The basal creatinine level in the blood increased, indicating muscle mass growth. The creatine phosphate and muscle glycogen reserves also increased.
Conclusions: Using power fitness models with medium intensity mode (R a =0.65) in the physical education of students with hypokinesia significantly affects the neuromuscular system adaptation. These models of classes also help to increase the functional body reserves in this category of students.

Keywords: students with hypokinesia, adaptation processes, power fitness, models of classes

Aging and cognitive performance

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Introduction Age-related changes in cognitive functions are very serious and multifactorial. Modern gerontological studies show a decrease in sensory response, deterioration in information processing and perception, as well as a decrease in mental performance with age. However, age-related decline in perception and information processing leads to increased fatigue and deterioration of cognitive functions, especially memory and thinking. At the same time, the physiological adaptation reactions occur, which prevent the aging process. Unfortunately, there are no studies of visual perception and cognitive performance in aging. Purpose to study the aging and cognitive performance.
Material and methods: Subjects of three age groups (30-60 years, 40 men and 60 women) were examined. Cognitive indicators were studied using a special psycho diagnostic test.
Results According to the concept of cognitive organization in aging, the mechanisms of searching for optimal mental activity have been studied. In the process of aging involution, adaptive- compensatory mechanisms for reducing visual perception and protecting the cognitive performance are activated. One of these mechanisms is associated with special organization of cognitive functions. With an age-related decrease in the ability to perceive and process information, the tension of the physiological functions on older people increases. As a result of the negative impact of aging, the effectiveness of mental activity decreases. A decrease in the ability to visually perceive and cognitive performance with age triggers compensation of physiological adaptive mechanisms with a change in the algorithm of activity. The key mechanism is to changes organization of information and structure processing. Increased determinism of the organization of information processing reflects the progression of aging and deterioration of cognitive functions, in particular operational thinking.
Conclusions The study revealed a tendency toward an increase in the determinism of the organization against the background of a simplification of the structure of cognitive activity during aging. A decrease in the prolongation of information processing is associated with a high determinism of the cognitive organization. The change in cognitive strategy reflects the physiological mechanisms of life extension during senile involution of cognitive functions.

Keywords: aging, cognitive performance, information processing

Mental readiness of female wrestlers

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Introduction The modern development of wrestling is characterized by the growing popularity and spectacle of competitive fights. At the same time, the training system does not take into account the gender characteristics of female wrestlers. Among the various factors of competition, mental readiness is of great importance. In addition, changes in competition rules in recent years have provoked an increase in the intensity and tension of the fight. Among the various manifestations of psycho-emotional states in female wrestlers, there may be anxiety, mental tension and even stress. This can negatively affect the effectiveness of competitive activity. However, among the factors determining the success of competitive activity in wrestling, one of the leading ones is the mental readiness of the athlete. Purpose to study the mental readiness of female wrestlers in the training system.
Material and methods: 24 elite wrestlers were examined. Mental state (Luscher color test), neurodynamic and cognitive functions were studied. In these tests, computer equipment "Multipsychometer-05" is used. Biomedical ethical agreement was given among all participants.
Results As a result of our study, data was obtained on the factor structure of the mental readiness of elite female wrestlers. The main factors that determine the structure of the mental preparedness in elite wrestlers include information processing, mental state, decision making and reaction speed. The study showed that mental readiness is ensured by: the ability of females wrestlers to perceive external information, the mental state, the quality and speed of verbal information processing and effective decision-making, which is typical for women. To optimize the mental preparedness of women wrestlers, an appropriate level of the perception and decision-making system is required.
Conclusions In elite female wrestlers, mental fitness is associated with cognitive and neurodynamic characteristics. In order to optimize mental readiness, female athletes must have an appropriate level of state of the system of perception and processing of external information. For this purpose, it is possible to apply motivational psychological attitudes to the training process and training system.

Keywords: mental readiness, female wrestlers, information processing

Readiness of future fitness trainers for professional activity in the modern fitness industry

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Introduction. The research is aimed at improving the system of professional training of future fitness trainers in higher education institutions. The problem of insufficient training of qualified fitness trainers, which would meet the standards of modern fitness clubs, forces certified trainers to work outside the specialty. To solve this problem it is necessary to try to improve the modern system of professional training by finding new research, methods and means of special training of qualified fitness trainers in accordance with the social demand, development of differentiated training methods based on motivation, building a system of fitness trainers, etc. The main methods and techniques of modernization of the modern system of training of fitness trainers are substantiated.
Research Methods. The research methodology involved theoretical analysis and a comparative analysis of pedagogical literature on fitness, regulatory documents, internet resources, and scientific articles was used to justify the theoretical material, determine the current state of problem development in the modern fitness industry, and clarify the content of concepts. The task of the experimental research was to conduct a survey of 8 managers from major fitness clubs to determine the key requirements employers have for certified fitness trainers. The analysis of the results after our experiment shows that the current system for training fitness trainers is somewhat outdated. Taking into account global and domestic achievements of scientists in the field of physical culture, new methods and opportunities are emerging to improve the training system for sports professionals. Fitness clubs play an important role in the modernization of the education system, as they have a significant influence on the requirements for trainers who want to work in these clubs. Almost every day, new types of workouts are being introduced, and every employer wants their trainers to be proficient in these methods.
Conclusions. Therefore, the issue arises of modifying the professional training system for fitness trainers, further exploring new research, and searching for new and improving existing ways, methods, and tools for the specialized training of qualified fitness trainers in accordance with social demand.

Key words: professional training, professional competence, fitness, fitness trainer

Polish Gymnastic Society "Sokół" in the Tarnopol Voivodeship in 1920-1939

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The purpose of this article is to present the activities of the Polish Gymnastic Society "Sokół" in the Tarnopol Voivodeship in the years 1920-1939. In the interwar period, the "Sokół" nests in the Tarnopol Voivodeship were part of the Małopolska District. In the 1920s and early 1930s, several "Sokół" districts operated in the Tarnopol Voivodeship: Brody, Brzeżany, Buczacz, Czortków, Tarnopol, and Złoczów. In the 1930s, the Tarnopol district operated, while some nests were part of the Lwów district. "Sokół" nests participated in work on shaping the infrastructure needed for their activities, including the construction of "Sokół" buildings and facilities for physical activity and military training. Sokół members took part in physical education courses. "Sokół" was active in the field of physical education, sports, and military training. In sports activities, they engaged in gymnastics, athletics, sports games, shooting, water sports, winter sports, and marching competitions. Educational, patriotic, and cultural activities were important in the work of "Sokół," including the celebration of national anniversaries, academies, and evening gatherings dedicated to Tadeusz Kościuszko, the patron of Polish Sokolism.

Keywords: Poland, military training, sports, Gymnastic Society "Sokół", Tarnopol Voivodeship, physical education, patriotic education

Effect of Different Exercise Interventions on Fitness and Technical Performance among Badminton Athletes: A Systematic Review with Meta-analysis

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As one of the world's ten most popular sports, badminton offers a high demand for athletes' physical fitness and technical. Exercise training is commonly utilized as an intervention for athletes. However, there has been no comprehensive review of the literature on the effects of sports training on physical and technical performance in badminton. The systematic review and meta-analysis aimed to determine the effects of exercise training on fitness and technical performance among badminton athletes. According to the preferred reporting items in the Guidelines for Systematic Review and Meta-Analysis (PRISMA) Statements, in August 2024, we examined electronic databases such as Web of Science, PubMed, Scopus, ProQuest, Springer Link, SPORTSDiscus, Taylor & Francis Online, and Google. A thorough search was done in Scholar and other grey reference sources. This study only included randomized controlled trials that investigated to determine how exercise training affected at least one aspect of fitness or technical performance in badminton players. The Cochrane risk of bias (RoB) tool was employed for the evaluation of RoB. The Consensus on Exercise Reporting Template (CERT) scale was used to assess the quality of the program data (Slade et al. 2016). All statistical analyses were conducted with Reviemanager 5.4.1 and STATA 15.0 software. Twenty-seven studies covering 866 athletes were selected for the systematic review, and twenty-three were included in the meta-analysis. The studies comprehensively examined how exercise training interventions impact various performance attributes. The key findings are as follows: These studies employed a range of frequencies from 2 to 4 days per week, with session durations between 25 and 140 minutes. Training intensities and types also varied, encompassing high-intensity programs and lower-intensity, progressive, and flexibility-focused protocols. The different exercise intervention significantly increased the athletes' endurance [I^2 = 91.6%, p < 0.001; SMD = 1.36, 95%CI (0.00, 2.73); Egger's test p = 0.716], agility [I^2 = 89.0%, p < 0.001; SMD = 1.28, 95%CI (0.72, 1.84); Egger's test p = 0.072], strength [I^2 = 90.1%, p < 0.001; SMD = -1.26, 95%CI (-2.08, -0.44); Egger's test p = 0.287], balance [I^2 = 52.0%, p = 0.002; SMD = -0.65, 95%CI (-0.91, -0.40); Egger's test p = 0.123], and However, there were no significant improvements in speed [I^2 = 87.7%, p < 0.001; SMD = 0.14, 95%CI (-0.58, 0.86); Egger's test p = 0.074], power [I^2 = 82.0%, p < 0.001; SMD = -0.38, 95%CI (-0.84, 0.08); Egger's test p = 0.272], and technical [I^2 = 79.0%, p < 0.001; SMD = -0.38, 95%CI (-0.93, 0.17); Egger's test p = 0.056]. This systematic review and meta-analysis demonstrate that while the different exercise training interventions showed significant positive effects on endurance, agility, balance, and strength, the impact on speed, power, and technical skills was less consistent, with some attributes showing negative trends or minimal improvements. However, no statistically significant effect was observed in terms of technical performance. These findings should be interpreted cautiously because speed, endurance, agility, power, strength, and technical skills have shown high heterogeneity. Additionally, evidence of potential publication bias exists in areas such as speed and technical skills, and the lack of significant practical improvement in these metrics suggests the need for further examination of the appropriateness of the interventions used to improve them.

Keywords: Badminton; Exercise interventions; Physical fitness; Technical performance; Athlete

The Role and Significance of Women's Physical Culture Congresses in the Second Polish Republic in Shaping Physical Education and Sports

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The aim of the work is to present the role and significance of the Women's Physical Culture Congresses in the Second Polish Republic in shaping physical education and sports. During the Second Polish Republic, two congresses devoted to women's physical culture were held. The first one - the 1st Polish Congress of Women's Sports and Physical Education - was held in Warsaw on 14-15 April 1928; the 2nd Congress of Women's Physical Culture was held in Warsaw on 28-29 April 1934. The congresses gathered several hundred participants, mainly women, including members of parliament, representatives of the teaching and medical community, sports instructors, athletes, organizers and sports activists. During the Congresses, a number of papers were presented and a number of resolutions and postulates were passed, including the following issues: developing methods and programs of physical activity for women that take into account differences in terms of gender; practicing sports appropriate for women, such as fencing, team games, swimming, rowing, sailing, skiing, mountain climbing, qualified tourism; shaping the educational values of sports and motor skills and abilities appropriate for women. It was postulated that the education of female sports instructors should be closely linked to the direction and development of women's physical education and sports. Female physical exercises, especially gymnastics, should be conducted in women's sections of men's sports clubs by female instructors, while medical care for exercising women should be provided exclusively by female doctors. There were calls to entrust women with managing women's sections of men's sports clubs, to establish independent women's committees at national sports associations, and to represent the women's sports movement in the international arena by women. The Congress participants appealed to state and local authorities to provide care and assistance to independent women's sports clubs, to organize physical education courses and camps and women's sports. The Congresses recognized sport as an important tool for women's equality in public life. The Women's Physical Culture Congresses proved to be an effective manifestation of women's power in the fight for autonomy in Polish sport.

Impact of smartphone use on postural control in healthy young adults

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Introduction: Using a cell phone requires focusing and mental concentration on the screen, which can diminish situational awareness. This study aimed to evaluate the risk of falls and postural stability under three conditions: free standing, passive cell phone use while standing, and while texting.
Material and methods: Thirty-four healthy right-handed subjects participated in tests conducted on two platforms: the Biodex_SD tilt platform for dynamic conditions and the Staniak platform for static conditions. Each participant completed three 20-second trials on both platforms under different free-standing scenarios: 1) eyes open (eo), 2) looking at a phone held in hand (eop), and 3) texting (sms). The parameters measured included the overall center of foot pressure path length (CoP), as well as its length in the anteroposterior (AP) and mediolateral (ML) directions. Additionally, the fall risk score (FRT) index was recorded. Statistical analysis was performed using Statistica software.
Results: The FRT index was significantly higher during texting (3.55 ± 1.58) compared to standing with the phone (2.63 ± 1.48) and without a phone (1.29 ± 0.71). The overall CoP path length and its length in the AP and ML direction showed no significant changes across trials. In each trial, sway in the sagittal plane was significantly greater than in the frontal plane. In static conditions, 26.47% of subjects held the phone with both hands, rising to 91.18% while texting. Under dynamic conditions, these percentages increased to 32.35% and 94.12%, respectively.
Conclusions: To prevent falls, increased public awareness and education on the safe use of smartphones are essential, especially during activities requiring screen focus in dynamic or unstable conditions.

Keywords: mobile phone, center of pressure, static balance, stability

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Body structure and physical fitness and health behaviors of female and male students of the University of Zielona Góra

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Aim of the work. To show the interdependence of declared health behaviors of male and female students with body structure and motor skills.
Material and method. The material was collected in the academic year 2022/2023 among 116 male and 112 female first-year students of the University of Zielona Góra. The anthropometric and diagnostic survey methods were used in the work. Based on the measurements of the height and weight of the subjects, the Rohrer weight-height index was calculated. The body type (slender, average, stout) of the male and female teams was determined using the formulas given by Wanke and Kolasa. The level of motor skills (high, average, low) of the subjects was determined on the basis of the tests included in the Pilicz test. The declared health behaviors of the respondents were assessed using a standardized survey questionnaire (IZZ, Juczynski). The general indicator of the intensity of health behaviors was presented on a sten scale. The relationship between the body build and motor skills of the respondents and the degree of intensity of health behaviors was performed using the Chi-square test. The material was subjected to statistical analysis using Microsoft Excel 2010 and Statistica 10.0.
Results. Students with an average body build and high physical fitness, compared to their peers with a slim and stout build, more often exhibit pro-health behaviors. Female students with a slim build and high physical fitness, relatively to their peers with an average and stout build, more often demonstrate pro-health behaviors.
Statements and conclusions. 1.Female students of physical education at the University of Zielona Góra, compared to male students, more often exhibit pro-health behaviors. 2.A significant correlation was noted between the body build of male and female teams and the degree of health severity. 3.No significant correlation was noted between the level of physical fitness of male and female students and the degree of health severity.

Keywords: academic youth, body composition, motor skills, health behaviors

Lifestyle-related behavioural changes and physical activity in undergraduates arriving at university

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Introduction. The study investigated the lifestyle behavioural changes of Slovak undergraduates after entering university. Furthermore, we examined the relationship between monitored variables and the weekly frequency of physical activity.
Methods. This cross- sectional study was conducted among 1665 first-year students (age M 20.73±1.39) at public universities in Slovakia. We used the Lifestyle-related behaviour questionnaire to collect data, which began in December 2022 and was completed in February 2023.
Results. We found negative behavioural changes regarding students ´ lifestyles at secondary school and after entering university. In terms of gender differences, females reported more negative changes after entering university. The most significant changes were recorded in the weekly PA frequency, sitting time, and time spent on a PC or mobile phone. We found significant correlations between variables monitoring lifestyle changes and PA in most cases in males and all cases in females.
Conclusions. Understanding the association between PA and different lifestyle factors would allow for establishing health behaviour interventions among students during the critical period of their transition from secondary school to university.

Keywords: health behavior, undergraduates, lifestyle

Analysis of the relationship between physical activity and quality of life of internally displaced persons

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Introduction. Active hostilities in Ukraine have caused massive population displacement, which has a profound impact on both the physical and mental health of displaced people. The quality of life (QoL) in the context of human health is determined by a system of certain factors, among which physical activity is one of the leading ones, which directly or indirectly has a positive impact on all areas of QoL. Therefore, the problem of assessing the relationship between physical activity and the QoL of internally displaced persons is relevant.

Material and methods. For this purpose, a comprehensive survey was conducted among 165 internally displaced persons (IDPs) (46 men and 169 women) aged 16 to 74 (average age 43.1±16.3 years) who were forced to leave their places of permanent residence and settled in the Volyn region (including the city of Lutsk). The components of quality of life (QOL) were determined using the SF-36 (Short Form Health Survey). The results were scored in the range from 0 to 100 points in a ranked calculation, with 100 points being perfect health.

Results. When interpreting the results of our study, we assumed that the overall QOL score consists of two general components: Physical component summary (PCS) and Mental component summary (MCS). The analysis of which revealed that the PCS in IDPs was 46.2±12.2 points; the MCS was lower compared to the physical component and amounted to 36.1±13.1 points. The analysis of the component structure of the PCS revealed a decrease in all its indicators. The indicator "role of physical problems in limiting vital activity" (RP = 45.5 points) was the one that decreased IDP QOL the most. At the same time, the average IDP general health (GH) score was 58.1 points. According to the analysis of the data, the highest of the mental health indicators is "social activity" (SF = 63.1 points). The indicator "the role of emotional problems in limiting vital activity" - RE = 34.8 points - reduced MCS and QOL IDP. The correlation analysis revealed a strong correlation between the physical activity (PF) and PCS scores at the level of r=0.85. There was a very weak positive relationship between PF and MCS (r=0.19). In a stressful situation of resettlement and adaptation to a new social and living environment, physical activity as a subjective assessment of the amount of daily physical activity by the respondent had a mediocre relationship with PCS (at r=0.5) and a slightly lower positive relationship with MCS (at r=0.4).

Conclusions. Therefore, there is a significant decline in both the physical and mental components of health in the QOL of internally displaced persons. A strong positive correlation has been recorded between physical activity and the physical component of QOL, and a slight correlation with the mental component. This must be taken into account when developing comprehensive support strategies for internally displaced persons, primarily aimed at reducing mental stress and overcoming the effects of post-traumatic conditions, which will be beneficial for overcoming the consequences of the war and improving the overall QOL of displaced persons.

Keywords: military conflict, quality of life, refugees, internally displaced persons.

Gender Differences in Physical Activity and Lifestyle Awareness Among Oncological Patients

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Introduction: Non-communicable diseases, including cancer, cause millions of deaths annually among individuals aged 30-70. While lifestyle is not the sole factor in cancer development, adopting an active lifestyle with regular physical activity can significantly improve patient prognosis and reduce the risk of recurrence. Our aim was to determine the level of physical activity performed by patients with oncological diseases and to provide insights into how physical activity impacts their quality of life.
Material and methods: We conducted a study with 102 oncological patients from Eastern Slovakia, using a paper-and-pen survey. An adapted version of the International Physical Activity Questionnaire (IPAQ) was employed to assess their physical activity levels, along with various aspects of an active lifestyle. The sample was divided into active and non-active groups based on the WHO recommendation of 600 MET-minutes as the cut-off point for adequate physical activity.
Results: In the female group, we found a significantly higher level of physical activity compared to males. We observed no differences between active and inactive oncological patients in terms of smoking, alcohol consumption, education, employment, duration of illness, physician-provided information on appropriate physical activity, awareness of the importance of physical activity, and awareness of the minimum physical activity requirements.
Conclusions: Our findings suggest a gender-specific approach may be needed, as females were more physically active than males. The lack of differences in lifestyle factors between active and inactive patients indicates that most are likely well-informed about necessary lifestyle changes. However, further research is needed to assess actual lifestyle behaviors among cancer patients.

Keywords: oncological patients, physical activity, gender differences, active lifestyle, quality of life, lifestyle behaviors

Cardiovascular fitness among university students

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Introduction: University studies frequently result in reduced physical activity (PA), potentially impacting the overall physical fitness and cardiovascular health of students. The COVID-19 pandemic has substantially worsened this issue. This study aimed to look at the relationship between morning resting heart rate (RHR), aerobic capacity, and VO 2 max among students from two universities in Košice, Slovakia.
Material and methods: The research sample included 586 students (227 males and 359 females; mean age = 19,75±1,55 years) from universities UPJŠ and TUKE in Košice. Participants performed a 20-meter shuttle run test during the academic years 2021/2022 and 2022/2023 in physical education classes. The times to reach aerobic and anaerobic thresholds, as well as the number of total shuttles completed, have been recorded.
Results: Mean VO 2 max values were 46 ml/kg/min for male students from TUKE and 41.9 ml/kg/min for male students from UPJŠ ($r = 0.29$, $p < 0.01$). A comparable trend was observed in aerobic capacity. Significant differences were observed among female students ($r = 0.14$, $p<0.01$), with those from UPJŠ demonstrating slightly higher VO 2 max values (34 ml/kg/min) than their counterparts from TUKE (32.5 ml/kg/min). The findings indicated a moderate to strong relationship between RHR and aerobic capacity in TUKE female students ($rs = - 0.4359$, $p <; 0.05$). This relationship is not evident in male students.
Conclusions: The research indicated significant differences in cardiovascular fitness among students from UPJŠ and TUKE. Men from TUKE outperformed their counterparts from UPJŠ across all aerobic parameters, whereas the differences among women were less significant, favouring those from UPJŠ.

Keywords: 20-meter shuttle run test, VO2max, aerobic threshold, anaerobic threshold

Physical activity, sexuality and cancer - interrelationships and their importance for quality of life

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Introduction: The aim of the research was to investigate the mutual relationships between physical exercise, sexuality of cancer patients and their impact on quality of life.
Material and Methods: The study was conducted on a group of 120 women staying in palliative and hospice care facilities of the Częstochowa Land Hospice Care Association, diagnosed with various types of cancer. Standardised research instruments were used: FEMALE SEXUAL FUNCTION INDEX (FSFI), Minnesota Leisure Time Physical Activities Questionnaire (MLTPAQ) and EQ-5D-5L questionnaire.
Results: The results of the analysis indicate that regular physical activity contributes to the improvement of patients' mental and physical well-being, which in turn influences a positive perception of sexual life. Women who were physically active reported higher levels of sexual satisfaction and better quality of life. Conversely, patients with cancer-related limitations often reported reduced sexual activity and problems with intimacy. Exercise can improve the quality of life of people with cancer.
Conclusion: Research confirms that there is a lack of educational support for integrating exercise and sexuality into the treatment process. The conclusions suggest the need to introduce therapeutic programmes that take into account both physical and mental aspects in the rehabilitation of oncological patients. Finally, the results indicate that understanding and promoting a healthy lifestyle, including regular physical activity and open sexual communication, can significantly improve the quality of life of people with cancer.

Keywords: physical activity, sexuality, cancer, quality of life

Relationships between socioeconomic factors and undertaking physical activity depending on lifestyle satisfaction in soldiers

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Aim: The aim of this study was to identify associations between selected socioeconomic factors, self-reported physical fitness and engagement in physical activity, and self-rated lifestyle satisfaction among professional soldiers.
Material and methods: The study participants were 200 randomly selected soldiers, including 38 women and 142 men. The variables analysed included age, sex, marital status, education, service position held, and number of years of service. Furthermore, the soldiers were asked for information related to self-reported physical fitness and smoking. With regard to physical activity, we examined whether self-reported life satisfaction determined the motives and limitations for undertaking this activity. The study used a diagnostic survey method; the research tool was an original survey questionnaire.
Results: Analysis of the results of the study showed that age (chi^2 = 12.50; p=0.005) and marital status (chi^2 = 9.16; p=0.028) were factors that significantly influenced soldiers' self-reported life satisfaction. Being in both a partnership and a marriage doubled the likelihood of experiencing good and very good life satisfaction (OR=2.00; p=0.017). The likelihood of experiencing better life satisfaction was significantly lower in soldiers rating their physical fitness as average (OR=0.033; p<0.001) and low (OR=0.005; p<0.001). Non-smoking soldiers were almost twice as likely as smokers to be satisfied with life to a good and very good degree (OR=1.992; p=0.034) compared to smokers. With regard to the motives and barriers to undertaking physical activity in the soldiers studied, based on their self-reported life satisfaction, the statistical analysis did not reveal significant differences.
Conclusions: The challenges faced by soldiers require responsibility, dedication, and commitment, both physically and mentally. Therefore, their level of life satisfaction is important. The present preliminary research in this field, although conducted on a small study group (200 people), indicated factors that may significantly affect soldiers' satisfaction with life. Further research is therefore needed in this area with a larger number of respondents, both men and women.

Keywords: lifestyle, physical activity, military, soldiers

Practical workshop attitude as a way to explore to explore perception in and of out of school physical activity -longitudinal studies-part III

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Background: This study discusses the possibility of including the workshop and narrative interviews (the quantitative approach is less important in our longitudinal studies at this moment) as a qualitative research approach in the physical culture. The aim of this paper is to describe a research method based on a qualitative narrative approach.
Method: The workshops as a qualitative approach to research can be increasingly used in the field of sport science because it true reflects how social reality is constructed an described. It is important for this multidisciplinary field of study because the workshops approach also allows researchers to very rich descriptions on the experience, thoughts, feelings in of out-of-school physical social activity context.
Results: This is confirmed by data obtained in research conducted among students of physical education. Of all the respondents (149) 73% were men, 27 woman. The age of the respondents ranged from 19 to 34 years. Over 90 percent of physical education students rated the validity of the workshop approach in examining physical activity very highly (8.9 points on a 0-10 scale).Exploring children's understanding of health and of out-of-school physical activity youth still is a special challenge for researchers.
Conclusions: Important reason why we think that the workshop can be considered as important qualitative research approach in physical culture is that it allows for the great depth in analysis and multiple modes of data collection. We know, that sport science is a very rich field of study examining the functioning of a healthy human body under the influence of exercise, training, and many other stimuli, and the ways of promoting health by means of physical activity. It is a multidisciplinary field of study, including such areas as physiology, psychology and others involves both practical and theoretical base.

Keywords: qualitative approach, physical education, workshop

Pain and physical activity referenced to selected personality traits

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Background: The chronic pain is a complex and challenging problem patients with low back pain and for the therapists. Increased fatigability, decreased endurance of the multifidus muscle has been demonstrated in low back pain patients in many research studies. Taking up physical activity belongs to one of the one most important fundamentals of the therapy.
Method: The survey included patients participating in a program involving therapeutic physical activity. Formal exercise programmers used in conjunction with other methods of treatment and psychological therapy are one the main forms treatments in low back pain. Physical activity is one on the factors influencing the health recovering -passiveness and apathy do not facilitate the persistence in realizing the aims of pain therapy. The general problem of the research required organizing the observed data in a reasonable structures or grouping the data. That is why the multidimensional explorative techniques, designed for the identification of systems within multidimensional data sets, were applied.
Results: In case of the examined group of 116 patients suffering from chronic pain (the significance of 2 variables explaining the changes in the intensity of symptoms was revealed. They were: passive attitude and level of activity. The regression models their participation to a considerable extent was revealed- ($B=0.52$, $p<0.0001$ and $B= -0,59$, $p<0.0001$).
Conclusion: Steady decline in habitual physical activity has resulted in lower functional ability and level of subjective sense of quality of life. This indicates the validity of developing an approach based on chronic pain and related symptoms a person - centred integrative model for the prevention connected with physical activity.

Keywords: integrative model, low back pain, traits, survey

Assessment of injury and functional movement capabilities of female rugby players taking part in the highest-league games in Poland

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Introduction. Rugby is a type of a contact sport discipline in which players are constantly exposed to traumas, due to the specific nature of the game. The range of actions on the pitch basing on numerous collisions and falls, combined with physical contact between players constitutes an important foundation for defining it as a discipline with an increased risk of trauma emergence. In connection with the abovementioned facts. Objective. The aim of this work was the analysis of functional motor capabilities with the assessment of incidence of traumas of female rugby players taking part in the highest-league games in Poland.
Material and methods. The examined group consisted of 40 "Rugby 7" players from Polish clubs between 18 and 37 years of age. The study was conducted by means of an original, anonymous questionnaire as well as the Functional Movement Screen (FMS) test.
Results. According to the obtained data, the occurrence of any trauma resulting from practicing rugby was declared by 97.5% of the examined group. It was shown that the athletes most often suffered from injuries of the ankle joint and the foot joints (26.86%) as well as the knee joint (26.15%). The average FMS test score (14.43 points) indicates functional patterns disorders with the presence of compensation and asymmetry among Polish rugby players. On the basis of collected results it has been proven that the sum of traumas has a significant impact on the FMS test result. The higher the number of traumas, the lower the score in the FMS test.
Conclusions. The made research shows that Polish female rugby players have high level of injuries. The diagnostic test made with FMS test results that Polish players presents irregular functional movement.

Keywords: FMS test, injuries, rugby

Relationship of selected health status indicators and diet of Polish e-sports players

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Introduction Success in esports depends on the mental and physical performance of the players. Diet is one of the elements affecting the health of gamers. The aim of the study was to evaluate the relationship between selected health status indicators and energy and nutrient intake in a group of e-sports gamers.
Material and methods The study included 175 Polish male e-sports players, by age 18-23 years, training at the professional and semi-professional level. Diagnostic tests of haematological and biochemical blood indices and a general urinalysis were performed. Blood and urine samples were analysed using the Eliza method. A quantitative dietary assessment was performed using the 3-day food diary records in Aliant. Pearson's non-parametric chi-square test was used in the statistical analysis, assuming a significance level of $p<0.05$.
Results The mean values of biochemical parameters in the study group were: glucose 5.31 mmol/l (SD=0.43), urea 4.86 mmol/l (SD=1.14), and total cholesterol 148.58 mg/dl (SD=28.65). Among the analysed blood morphology parameters, the mean leukocyte level was 6.93 thousand/µl (SD=1.74), erythrocytes 5.13 million/µl (SD=0.33), and hemoglobin 15.17 g/dl (SD=0.92). Elevated glycaemia was noted in 28%. The average energy intake in the diet of e-athletes was 2154 kcal/day (SD=637,36), protein intake 97.95 g/d (SD=30.95), total carbohydrates 246.96 g/d (SD=77.52), fats 83.95 g/d (SD=36.43), cholesterol 298.11 mg/d (SD=233.14), and fiber 15.53 g/d (SD=6.74).Statistical analysis showed a positive correlation between the blood cholesterol level and the consumption of proteins ($r=0.54$; $p=0.01$), fats ($r=0.26$; $p=0.008$) and simple sugars ($r=0.30$; $p=0.030$).
Conclusions Among Polish e-sportsmen, normative parameters of blood morphology and biochemistry and urine were found, as well as an unbalanced supply of certain nutrients in the diet. The health status can be considered good, except for the glucose results. Significant relationships were also demonstrated between the consumption of proteins, fats and simple sugars and the concentration of cholesterol in the blood, which indicates relationships between certain health indicators and the diet of e-sports players.

Keywords: gamers, nutrient intake, blood and urine tests

Gait analysis following unicompartmental knee arthroplasty utilizing CAREN Extended virtual environment

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Osteoarthritis of the knee joints most often develops in the medial knee compartment, and is manifested by pain, reduced mobility and deterioration in the life quality. These changes are the reason for the deterioration of the walking pattern. The main aim of this study is to analyze gait pattern, one year after unicompartmental knee arthroplasty. The study involved patients following unicompartmental arthroplasty of the knee joint. Subsequently, gait analysis was performed in the virtual environment of Caren Extended environment in patients whose profiles were matching in terms of age and gender, fitness, and period following surgery. Data with motion parameters was acquired using an optical motion capture system. The kinematic and kinetic gait analysis demonstrated differences in the distribution of forces, moments and angles in both lower limbs. In addition, each of the subjects was characterized by a different motion pattern and gait cycle in terms of body positions during walk. Detailed biomechanical analysis of the lower extremities during gait activity showed significant differences between gait patterns, indicating the presence of an acquired, chronic gait pattern.

Keywords: knee arthroplasty, gait, motion capture system, virtual reality.

Information technology in teaching sports games

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Introduction. Distance learning as a form of education provides for the organization of the educational process, in which most of the pedagogical activities and procedures are carried out using modern information and communication technologies under the condition of territorial isolation of the teacher and the student. Today lecture and practical classes on sports games in Kharkiv State Academy of Physical Culture are held remotely in synchronous and asynchronous mode, which encourages the use of a variety of modern technologies. This is not an easy process especially when conducting practical classes, posing methodological challenges for teachers. The study is to analyze the possibilities of using modern information technologies in the educational process of students in teaching sports games.
Material and methods: the study was conducted in a group of students of Kharkiv State Academy of Physical Culture of 30 people engaged in different types of sports games. We used methods of theoretical analysis of literature sources; method of pedagogical experiment; ascertaining stage of the study was to identify the attitude of students to the use of information technology in the organization of distance learning of sports games; methods of mathematical statistics.
Results. Information technologies have already become a part of our life, learning, communication, training and sports. In Kharkiv universities teachers professionally use computer- based learning resources, video, audio and multimedia, educational platforms, and develop their own educational products. The greatest emphasis is placed on the creation of combined training programs, which use video recordings of the performance of technical elements and multimedia clips with elements of analysis of their performance. After watching these videos, we go out with the students to safe rooms and start practicing the learned elements. Most of our students are located in other cities and countries around the world and can only attend the class remotely via online platforms. Each student places a video camera in such a way that it is clearly visible how he performs the game actions, the teacher looking at each of them corrects the performance, corrects mistakes, gives advice. The practical part of the class lasts 25-30 minutes, during which basic skills are practiced and motor actions and technique of performing elements in sports games are improved. All classes are recorded on video, which is provided to students for independent study. That is, in another country of the world, a student can watch a video recording to reproduce the educational content provided to him by the instructor during the class and record it on his own device. This is how we have an independent practicing and consolidation of elements of sports games. During the experiment, we surveyed students on improving the methods of teaching sports games with the use of information technology. We received answers from the respondents about purchasing several high-quality video cameras and conducting classes, filming not in one frame, but from several. According to the students, it should be better to see how to perform tasks correctly. There were also wishes to improve the multimedia content and to add computerized three- dimensional models of players that simulate the ideal performance of each exercise.
Conclusions. As a result of our research we collected a large amount of video, audio and multimedia learning content from different types of sports games, we also recorded and stored all the videos of students that they sent as fulfillment of independent works. For this purpose we purchased several large capacity SSD disks. In the future we plan to buy several professional video cameras and equip with them the sports ground, which is located in the underground shelter of the Kharkiv State Academy of Physical Culture. Most of our teachers direct their efforts to the continuous improvement of educational content and development of innovative information tools for teaching sports games.

Keywords: Information technology; sports games; computer-based learning; training; bomb shelter; sports

Therapeutic benefits of kayaking for motor function and well-being in Parkinson's Disease patients

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Introduction: As a progressive neurodegenerative disorder, Parkinson's disease significantly impacts patients' quality of life by diminishing motor skills and quality of life. With pharmacological treatments showing limited effectiveness, there is a growing interest in exploring the therapeutic potential of physical activity as an adjunctive treatment.
Aims: This study aimed to investigate the effects of kayaking, as a form of physical activity, on the health and well-being of people with Parkinson's disease.
Material and methods: The study involved 30 patients diagnosed with idiopathic PD (age 65.72 ± 7,21 years, duration of the disease 8,18 ± 5,39 years) in stage II, III - according to the Hoehn & Yahr scale, divided into two groups – an experimental and a control. The experimental group participated in regular kayaking sessions over 12 weeks, while the control group adhered to standard therapeutic recommendations. Participants were assessed before and after the program using the Unified Parkinson's Disease Rating Scale (UPDRS) for motor skills, the Timed Up and Go (TUG) test for balance, and the SF-36 questionnaire for well-being.
Results: The results demonstrated that regular kayaking significantly improved the experimental group's motor skills and well-being. Participants experienced an average 16% improvement in UPDRS scores, indicating a reduction in motor symptoms and a 14% improvement in TUG test times. Additionally, SF-36 questionnaire results showed a 22% increase in overall well-being.
Conclusion: These findings provide empirical evidence supporting the efficacy of kayaking as a complementary form of physical therapy for patients with Parkinson's disease. The results also underscore the need for further research to fully understand the mechanisms behind this activity's benefits and examine its long-term impact on patient health.

Keywords: kayak tourism, physical activity, Parkinson's disease, therapeutic exercise, outdoor activities

Sensorimotor, biomechanical and psychological developmental aspects Taekwon-do practice

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In this study we concentrate on the notion of contact with reference to martial arts, trying to perform the analysis from the perspective of biomechanics, psychology, with the inclusion of neurobiological approach. Many our study aims at presenting the results of the deep research and concepts that contribute to the understanding of the value of development and teaching of martial arts in the context of the notion of plasticity brain. The research data indicate that there are substantial arguments that allow us to state that participation in martial arts such as Taekwon-do, (judo and aikido) is strictly connected with an integrated activity in different fields of child's and adolescent's development .In the case of adults it supports the functioning of the nervous system. The Taekwon-do training methodology and the message that is conveyed by this type of martial arts, together with the expression of this message in the shape of particular techniques, is connected with a comprehensive influence on the organism. Based on the research approach specified as neuroscience, one can interpret the research reports present in literature, that indicate positive changes in particular brain structures, involved, among others, in the ability to concentrate, as a result of Taekwon-do trainings.

Keywords: Taekwon-do, stimulating influence of development, neuroplasticity

Multi-dimensional approach to improving functional efficiency through low back pain patients

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According to the modern biopsychosocial model of treatment patients are active processors of information and not only passive side. Clinical practice indicates that the understanding individual patients context is important for improvement of an individual's psychophysical functioning encourages multiplying and strengthening positive therapeutic effects locomotion optimization, functional improvement. Chronic Low Back musculoskeletal pain often restricts the performance of activities and is a problem, which is associated with important consequences to patients. Treating this condition still is a challenge. We know that there are many different aggravating factors associated with everyday life and specific selected chronic back pain aggravators. Among these factors, the following are particularly frequently mentioned and based on scientific research results: the way of realizing movement while performing individuals tasks, very numerous and varied biomechanical and psychological individual factors personality, emotional factors, anxiety and anger, level, of self-assessment, stamina, emotions, psychosocial factors, resistant to stress and tension, persistence physical and mental. The results of our long-term may be a useful determinate in both prognosis and interventions.

Keywords: functional improvement, back pain aggravators, fear avoidance

Protective role of physical and mental activity Taekwon-do in the nervous system - chosen issues

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Taekwon-do as very complex physical and mental activities close associated with health-related outcomes represents a flourishing research area needing extensive improvement in practical approaches and theoretical approaches. Interdisciplinary research results showed that the Taekwon-do as composed of complex body and nervous system actions can improve body perception and awareness and body sensation originated from within the body. Several different studies from others authors have reported that Taekwon-do training could improve brain activity, as assessed with an electroencephalogram. Taekwon-do training is known to encourage not only motional control in response to the strong distress, confidence, and sense of efficacy, cultivation motivational and cognitive factors which studies have reported to be effective in improving clever actions. It is are interesting for us in regard to biomechanical, cognitive, mental, behavioral and emotional variables. We planning use information describing those parts brain hemisphere is known to be associated with the sense of space and body perception. Its reason why we planning our future study body perception in a number groups and using physical and psychological methods self-assessment. The research will also use, among others the Motion Analysis Laboratory in the Functional and Applied Biomechanics section.

Keywords: Taekwondo, body perception, health-related outcomes, sense of efficacy

Alternative diets in the collective nutrition of the Polish Armed Forces?

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Background: Proper nutrition is one of the key factors influencing health. Alongside adequate training and equipment, it is essential for serving in the Polish Armed Forces. Polish soldiers are subject to collective nutrition standards, which are regulated by the Regulation of the Minister of National Defense of April 28, 2022, regarding free meals for professional soldiers of the Armed Forces of the Republic of Poland. Unfortunately, this regulation does not include guidelines for soldiers following alternative diets (e.g., vegetarian, vegan, lactose-free), which are becoming increasingly popular among the Polish population. The aim of the study was to assess nutrition in military canteens, compare the nutrition provided by canteens to dietary standards, and evaluate the expectations of current and retired uniformed service members.

Methods: The study was conducted among 66 soldiers of the Polish Armed Forces. An online survey was administered, utilizing a custom questionnaire consisting of 40 questions. The questions addressed the organization of nutrition in military canteens, the availability of alternative diets, as well as the individual expectations of current and retired soldiers.

Results: The largest group of respondents was aged 18-25. Only 9% of soldiers have access to vegetarian and/or vegan meals, as well as options that consider allergies and food intolerances in canteens. The surveyed soldiers rated the quality of nutrition on average at 2.68 on a 5-point scale. Military canteens do not provide soldiers with a sufficient amount of food.

Conclusion: Providing collective nutrition that includes the preferences of soldiers on alternative diets presents a challenge for canteens. Further scientific research is necessary, along with the development and implementation of standards and recommendations for soldiers following alternative diets, which could be adopted within the Polish military.

Keywords: alternative diets, vegetarian, Polish Armed Forces, soldiers

Lifestyle Medicine in clinical practice at Österåsen Lifestyle Medicine Clinic in Sweden

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Lifestyle medicine (LM) is a growing new discipline of medicine, founded in the US in 2004. It is based on therapeutic lifestyle modification interventions to treat and prevent disease. Its holistic approach uses interventions to improve: sleep, nutrition, physical activity, relationships, and reduce stress and substance abuse. Österåsen LM Clinic is the world's only public sanatorium implementing therapy based on LM principles and pillars into treatment and rehabilitation. The implemented LM program activates patients to cooperate. It teaches responsibility for one's own health. It leads step by step giving knowledge and tools to help change habits to more health-promoting ones. Patients are assigned to the most appropriate lifestyle intervention program for them. Programs include 4 fields: obesity treating, diabetes, helping people recovers from addictions and managing stress. My internship at that clinic allowed me to compare the principles of Österåsen with sanatorium's treatment in Poland. The conclusions can be inspiring.

Keywords: lifestyle, quality of life, activates patients

Normative and Limit Values of Speed, Endurance, and Power Test Results of Young Football Players – Percentile Charts

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This study aimed to assess the development of speed, endurance, and power in young football players and to create percentile tables for standardized assessment. Cross-sectional data were collected from 495 players aged 12–16 years at RKS Raków Częstochowa Academy in 2018–2022. Players participated in a systematic training in which running time 5 [m], 10 [m], 30 [m], lower limb power (standing long jump), and maximum aerobic speed (MAS) were measured using the 30–15 Intermittent Fitness Test. All tests were performed under constant environmental conditions by qualified personnel. Statistical analysis included ANOVA and percentile distribution for P3, P10, P25, P50, P75, P90, P97. Results indicated that the most significant improvements occurred between the ages of 13 and 14, with increased speed over all distances and a significant increase in power. The study identified key developmental stages for each motor skill, with a significant effect of peak height velocity (PHV) on performance. Percentile tables were developed, highlighting improvements in speed 5 [m]: 0.087–0.126 [s]; 10 [m] 0.162–0.215 [s]; 30 [m]: 0.438–0.719 [s] and power in the long jump test: 31–48 [cm]. Improvements in MAS ranged from 0.3 to 0.6 [m/s] across the percentiles. The results highlight the need for individual training programs tailored to the biological maturity of players. The developed percentile tables offer a valuable tool for coaches and sports scientists to monitor progress, optimize training loads, and minimize the risk of injury, providing a frame of reference for assessing the physical development of young soccer players. Future research should focus on extending these tables to other age groups and genders to refine training methodologies further.

Keywords: Speed, Endurance, Power Young Football Players

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Sanogenicity as a factor in the mental health of military personnel

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Introduction. The importance of sanogenicity, which indicates the processes that contribute to the preservation and improvement of health in conditions of various stressful situations, in the conditions of military service, where military personnel are exposed to extreme stressful effects, becomes especially relevant. Sanogenicity, particularly in the context of military service, includes factors such as psychological resilience, adaptive capacity, level of social support, and the presence of effective coping strategies. The successful functioning of these mechanisms allows the military to effectively resist the influence of stressors and maintain a high level of performance. The active use of strategies to overcome stress is an integral part of the sanogenicity of the military. This can include relaxation techniques, exercise, meditation, and group therapy to promote positive thinking and reduce emotional burnout. The study is aimed at studying the psychological features of sanogenicity of military personnel, which determine the ability of their body to maintain a stable state of health under conditions of stress.

Material and methods. The study assessed the level of sanogenicity among military personnel using psychodiagnostic methods: the Spielberger-Hanin Anxiety Rating Scale, the Hospital Anxiety and Depression Scale (HADS), and the Beck Anxiety Scale. Sanogenicity, defined as an individual's ability to adapt to stressful conditions, is a key factor that directly affects the mental health of military personnel. In the conditions of military service, where individuals are regularly exposed to psychological and emotional stress, the importance of this aspect becomes particularly pronounced. The assessment of sanogenicity makes it possible to detect and measure the level of anxiety, which can negatively affect not only the efficiency of the performance of official duties, but also the general state of mental health of military personnel.

The results. The results of the assessment on the Spielberger-Hanin Scale revealed that 64% of the military had an elevated level of situational anxiety, which indicates their clear reaction to external stress factors that they encounter during the performance of their official duties. The results of the Hospital Anxiety and Depression Scale (HADS) showed that anxiety was detected in 54% of respondents, which indicates the presence of a moderate level of anxiety, which may be due to the specifics of military service. According to the Beck Anxiety Scale, 58% of the respondents had a moderate level of anxiety, which indicates that a significant part of the military experiences some degree of anxiety, which can be caused by specific stressful situations that they encounter during the performance of their official duties ties A moderate level of anxiety can negatively affect the general psychological state of military personnel, affecting their productivity, as well as the ability to adequately respond to stressful situations.

Conclusions. The results of the study demonstrate that anxiety symptoms are common among military personnel, which confirms the need for a comprehensive approach to the assessment of the mental health of military personnel, which allows timely detection and correction of possible problems, which can significantly improve their quality of life, increase their efficiency in the performance of official duties relationships, to ensure psychological well-being and stability in the face of modern challenges.

Keywords: sanogenicity, military personnel, stress, anxiety, resilience, mental health

The use of foam roller exercises and stretching method as a tool for improving the flexibility of hamstring muscles

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Introduction: The research deals with the impact of exercise on a foam roller to develop flexibility in pupils attending primary school in older school age. The research verifies the effectiveness of foam cylinder exercises in terms of developing flexibility. The aim of the research is to evaluate the effect of foam roller exercise on the level of joint mobility and to compare it with the contract-relax proprioceptive neuromuscular facilitation method (PNF) in girls of an older school age.
Material and methods: Thirty healthy girls aged 13 – 14 were randomly divided into three groups. The first group used the foam roller release method (FOAM, n = 10), the second group used the PNF contract-relax stretching method (CRPNF, n = 10) and the third group was only control and did not undergo any intervention (CG, n = 10). The training program was applied to both groups twice a week for four weeks. The flexibility of the hamstring was measured by a sit and reach test before and after the intervention period. Based on the results of the Shapiro-Wilk test, analysis was conducted using a paired t-test.
Results: After the application of the training program, there was a significant improvement in the level of joint mobility in both the FOAM group (p = 2.95E-09) and in the CRPNF group (p = 0.00098) compared to the control group. At the same time, there was a greater improvement in the FOAM group than in the CRPNF group (p = 0.00189). Based on a statistical analysis, the exercise on a foam roller has an effect in terms of stretching the hamstrings.
Conclusions: Research has shown that after intervention with exercise using a foam roller, the flexibility of the hamstrings has developed. Exercises with foam rollers proved to be more effective in the experimental group than the used technique of contra-relax proprioceptive neuromuscular facilitation to increase ROM hamstrings.

Keywords: foam roller, flexibility, stretching, hamstrings, fascial technique, exercises.

Physical activity of inmates in prisons in Poland 1918–1939

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Introduction: Preparatory activities on the establishment of the Polish penitentiary system were undertaken even before Poland formally regained its independence. However, the actual takeover of prisons from the partitioning governments did not take place until 11 November 1918. The first legal basis for the functioning of the Polish prison system was the decree of the Head of State Józef Piłsudski of 8 February 1919. "On the organisation of prisons" and the "Prison Rules". Activities in this area were undertaken in the inter-war period, and the initiator and promoter of the introduction of physical exercise into educational institutions for the maladjusted youth and prisons was Zygmunt Bugajski.

Material and methods: A search for sources was carried out in the Archive of New Records, the Military Historical Bureau – Central Military Archives (Warsaw), the Central Training Centre of the Prison Service (Kalisz), the National Library and the Library of the Museum of Sport and Tourism (Warsaw). Historical research methods were used, mainly source analysis and criticism.

Results: After Poland regained its independence and overcame the problems associated with the unification of the penitentiary system, an effort began at reforming the educational programme in the prison system. The concern for the development of the physical fitness of inmates, especially those serving long-term sentences, was seen as one of the most important elements of this programme. Special exercise rooms with modern gymnastic equipment were set up, where regular gymnastics was carried out. Pioneering measures in this regard were initially introduced in two Warsaw prisons and later, after the positive impact of exercise on inmates had been confirmed, sports infrastructure was gradually created in other prisons as well.

Conclusions: All initiatives towards the development of physical education undertaken in individual countries, including Poland, reflected the provisions of international penitentiary congresses. They emphasised the importance of physical fitness of inmates and recommended the implementation of physical exercise and sport, recognising it as a factor of educational impact that compensated for the lack of employment opportunities. The improvement programme was extended to inmates of both sexes, as well as to minors because for them physical exercise was essential for the proper development of the young organism.

Keywords: physical culture, penitentiary system, prison, inmate