

INSHS 2021

17th Annual Convention and International Conference
of the International Network of Sport and Health Science



BOOK OF ABSTRACTS

27–29 May 2021, St. Petersburg, Russia



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OUR PARTNERS



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VICE-RECTOR'S ADDRESS

Good afternoon, dear colleagues and conference participants!

We are pleased to welcome you to the 17th Annual Convention and International Conference of the International Network of Sport and Health Science. It is a great honor for Peter the Great St. Petersburg Polytechnic University to host the first Scopus conference in the field of sports in cooperation with the International Association INSHS. Preparations for this event took about a year, and we hoped that in 2021 it would be possible to hold it in person. We do not lose hope that in the future our plans will definitely come true.

After all, increasing the role of physical culture and sports is a top priority in our country. The sphere of physical culture and sports performs many functions in society and covers all age groups of the population. A worldwide trend is also a colossal increase in interest towards elite sports, which reflects fundamental shifts in modern culture. In many foreign countries, physical culture, health and sports activities organically combine and unite the efforts of the state, its government, public and private organizations, institutions and social institutions. Our university keeps up with trends and holds regular sports events and trips, opens new educational programs, cooperates with many state and public organizations and structures. We are grateful for cooperation with the international association INSHS, which proposed St. Petersburg as the venue for the current conference.

This conference has received great support from the Ministry of Sports of the Russian Federation. We thank all the participants for their interest in the conference. The presentations deal with some major modern challenges. The 3 scheduled days will be eventful and will include keynote speakers from around the world, as well as oral presentations and e-poster presentations. I am sure that the results of scientific research presented in the book of abstracts of the conference participants will be actively discussed after the conference. Physical culture and sports, including sports of the highest achievements, cannot develop without advanced scientific developments. Achievements of athletes are based not only on willpower, experience, training, but also on a scientific approach to sports disciplines. Therefore, it is extremely important to exchange experiences with colleagues from all over the world.

We would like to especially thank Ian Whyte, Joel Gaillard and Henriette Dancs for their enthusiasm, involvement in the preparation process. We welcome everyone to Peter the Great St. Petersburg Polytechnic University.

Vitaly Sergeev
Vice-Rector for Research
Peter the Great St. Petersburg Polytechnic University

OPENING SPEECH FROM INSHS GENERAL MANAGER

Dear all, as general manager of INSHS I am very pleased to have this opportunity to say a few words at the opening of 17th International Conference of the International Network of Sport and Health Science, which is the main conference of INSHS.

Many other noteworthy events, from conferences to festivals to sporting events, have been canceled or postponed because of the coronavirus, social distancing during the coronavirus pandemic put an end to all large face-to-face gatherings, resulting not only in a disruption of social life as we know it, but also in the cancellation of many of the most important global conferences. Thanks to the unfailing loyalty of our partner Peter the Great St.Petersburg Polytechnic University, we have been able to organize our annual online conference, which is not a miracle, but a remarkable indicator of the consistency of our network!

INSHS this is 25 university departments/faculties from 22 countries (EU and non – Eu: Asia, Africa, America) Individual members from another 5 universities Approx. 130 persons on our direct contact list. Partnership with 4 journals (JHSE, SPARK, European Journal of PE, RRISS). Strategic university key partners: agreement with Eotvos Lorand University (Faculty of Education and Psychology, ELTE, Budapest, Hungary). Partnership with global sport innovation center (GSIC), Madrid and an ongoing with Guatemala Olympic Committee. This is also special events: 15 annual conventions since 2005 12 International Christmas Sport Scientific Conference Approximately ongoing 50 events and project collaborations are planned in 2021- 22. Two research collaborations: Appr. 15-20 international sub- groups in the INSHS consortium project to develop (2021-22) - based on the feedback of 80 colleagues from about 30 universities (25 countries). After Szombathely, Hungary (2005), Magdeburg, Germany (2006), in Ljubljana, Slovenia (2007), in Bad Gleichenberg, Austria (2008), in Cardiff, Wales (2009), Telemark, Norway (2010), Tartu, Estonia (2011) and Zagreb/Opatija, Croatia (2012), Volos, Greece (2013), Alicante, Spain (2014), Alexandria, Egypt (2015, canceled), Brno (2016), Nancy, France (2017), Calpe (2018), Las Palmas, Spain (2019). Budapest, Hungary (2020) this 1st Video-conference, St. Petersburg offers me this very special opportunity to express my sincere thanks to the organizers and in particular Prof. Vitaly V. Sergeev, (Vice-rector for Research) Maria Ganapolskaya and Vladislav Bakayev, Thank you for the enormous amount of work you have done and for the time you have devoted despite the difficulties and your respective schedules to the success of this congress! Again, this training program could not have been made possible without Peter the Great St. Petersburg Polytechnic University represented by Prof. Vitaly V. Sergeev, (Vice-rector for Research) Maria Ganapolskaya and Vladislav Bakayev distinguished members of Peter the Great St. Petersburg Polytechnic University. I would like to express our heartfelt thanks in particular to them! INSHS is really impressed about the speed and professionalism of this congress construction. Thank you for the work that you will also carry on into these two coming days! I must also thank Henriette Dancs, Ian White for their effective contribution and enthusiasm also and our honorable speakers who agreed to provide their contribution and expertise. They have been working with us since the beginning of the planning stage and they are still here today for all of us, even though they are both very busy with their responsibilities at their universities and agencies. We truly appreciate your dedication.

Sport, particularly university sport, cuts through the differences and boundaries. It can help bring young generations and nations together. It drives cultural, social, and environmental changes for the better. With its tremendous potentials, we can broaden the horizon of sport in our lives and communities. This traditional INSHS event in the spirit of Sport Science conference aims to provide an opportunity to share and acquire knowledge in the sport field for people working or doing business in a variety of sport industry sectors such as sport for youth, sport for student, sport for community, professional sport and sport high-performance. In addition to presentations and speeches delivered by the world-class sport experts, the conference will offer participants access to both basic and advanced sports-related knowledge, and accentuate the importance of sport practices. We're not only talking about top-level competitions organised with fancy equipment for a small number of people. Neither are we talking about sport as simple exercise, without structure or objectives. We are also talking about simple organized and supervised activities, which can help integrate people into society. Sport which imposes discipline and

respect, where there is no rule left. Sport which re-installs communication where dialog has long been extinguished. Sport which builds bridges where only walls exist. This is an International Conference and the exchange of information, ideas and experience which will occur during the coming week will help us to learn from the presentations and conference which will be presented here! And above all, we're talking about sport which can be introduced everywhere because it requires only creativity and minimal resources.

For many years the conference has been inspired and encouraged scientists, researchers, managers, experts, professors, lecturers, coaches, athletes and students who performed their teaching, training and learning tasks at education and training institutions as well as organizations related sports.

It is a great opportunity to present our scientific works and researches in the field of sport, including sports event management, sport facilities management, sports business management, sport marketing and sponsorship, public relation in sport, and sports tourism and recreation management, sport and disabilities etc.

Furthermore, the conference will offer an opportunity to scientists, researchers, experts, managers, professors, lecturers, coaches, athletes, students and other participants to share, exchange and discuss their viewpoints, and make their opinions and experience known to native and foreign renowned experts in physical education, sport physiology, sport nutrition, sport psychology as well as sport and health promotion.

Above all, valuable knowledge and experience obtained in this conference will become beneficial to not only a single individual or organization but also the entire world once they are spread and shared, or applied by participants to their sport researches, sports management in their countries.

For many years we have staged over 1000 presentations in all disciplines of sport science, like Sport Medicine, Sport Training/Coaching, Sport and Social Sciences, Sport Management, Olympic Movement, Olympism, Healthy Lifestyle, Active aging, Recreation, Sport Tourism, Performance Analysis in Sport ... and of these, over 600 have resulted in publications in books or journals. These are looked upon as useful additions to developing CV's.

The last publication of the new Book by Mike Hughes, Henriette Dancs, the new Journals as Spark and RRISS, are undoubtedly the best way to disseminate knowledge and should therefore be considered a valuable option within the researchers' career paths.

Despite the pandemic, the years 2019 and 2020 are special years for all of us at to celebrate INSHS as perfect example for a good functioning higher education thematic network. We hope this international conference will help foster exchange between sport science specialists from all over the world ! With the publication of academic research in this area, we seek to encourage collaboration and international interaction. Enjoy yourself in this first online INSHS conference, enjoy your presentation, appreciate the efforts of others in theirs and, most of all, have a great days!

Joël Gaillard
General Manager
INSHS

KEYNOTE SPEAKERS

S1

SCIENTIFIC AND ACADEMIC PERSPECTIVES OF THE CENTERS OF OLYMPIC STUDIES IN THE UNIVERSITIES OF THE 21ST CENTURY CONFERENCE SPEAKERS

María José Martínez Patiño¹, Anxo Pena Pérez²,
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Olympic Studies Centers play an important role in the world today: the strategic vision of promoting an Olympic Studies Center in a university for the promotion of Olympic values in students, for a deep knowledge of the Olympic Movement, the research and development of Olympic sports and the union of the universities from the perspective of an alliance between the Olympic Studies Centers in the future. The Olympic Movement is an action elaborated by International Olympic Committee. The most valuable heritage of the Olympic Movement is that it brings together more than 200 countries. The National Olympic Committees and Olympic Studies Centers promote the Olympic Movement. The goals of the Olympic Studies are to generate a multicultural knowledge perspective, to create a multidisciplinary network linking academics around the world, to promote the Olympism and its values, to enrich most needed communities through sport education. Olympic Movement does not touch any country in the world therefore this is a strategic task. Main goals of the Olympic Studies Center are to enrich, preserve and disseminate the written and audiovisual heritage of the International Olympic Committee (IOC), to offer researching tools and service of content creation to the IOC administration, to encourage research, teaching and publications related to Olympism, to collaborate with the other members of the Olympic Movement in order to preserve and disseminate the Olympic heritage.

S2

THE CONNECTION BETWEEN APPLIED PERFORMANCE ANALYSIS, DATA SCIENCE AND RESEARCH

Michael T. Hughes
Red Zone, UK

This is a presentation drawing on 20 years of experience of working as an applied performance analyst to explore the evolution of the role over time and how it interacts with other science disciplines. As technology has advanced the breadth of this role has grown. There are huge amounts of data available to analysts now from third party suppliers to supplement their own data. This data can be provided in real time and integrated into multiple software platforms. Work flows

can be made more efficient via hardware developments and previously unseen footage can now be captured. However, the impact that a performance analyst can have on a high performance environment still fundamentally hangs on the strength of relationship with the coaching team. Maintaining this relationship and delivering to the team across all the other areas is now a huge challenge and requires a department rather than an individual. As such a performance analyst's role has evolved from primarily being a notational analyst, to a jack of all trades, to now being a co-ordinator and team leader. The presentation will look at the challenges associated with how the role now sits in elite sport and how the skill set of a performance analyst has had to change. What are the knock on effects of this for research and technology and how can we all better support performance analysts in the future. Can organisations like ISPAS provide a framework to describe these different roles and different skill sets.

S3

RE-IMAGINING THE SPORTS INDUSTRY

Iñigo Bonilla Barroso
Global Sports Innovation Center, Madrid, Spain

The pandemic has completely changed the rules of the game and has accelerated the digital transformation process of most of the sports organizations. GSIC is playing a key role in this process, supporting some of the leading sport organizations to connect with the right partners across multiple sport scenarios such as: Team and player performance, Smart Venues, Bi and analytics, fan engagement, media, e-sports and fitness and wellness.

For the first time, the vast majority of the sport organizations are allocating resources for innovation and digital transformation in order to engage with the younger generations providing them with new tools to follow the competitions and to engage with the rest of the community. Through my presentation I will share some of the latest trends of the GSIC members and how they have been providing with outstanding solutions to the sport organizations in order to engage with their fans living the stadium experience from their homes. I will share as well some examples of the solutions that the sport entities are currently using to manage the return of the fans with the new measures of wearing masks, social distancing and so on.

S4

HOW COVID-19 CHANGED THE EDUCATIONAL PROCESS OF FUTURE PE TEACHERS:WHAT WE HAVE DONE AND WHAT CAN WE IMPLEMENT IN FUTURE - EXPERIENCE FROM NORTH MACEDONIA

Biljana Popeska
Goce Delčev University of Štip, Republic of North Macedonia

COVID-19 changed our reality and affected all aspects of our life. Education was no exception. The process of education at all levels was interrupted and later significantly changed by transferring to distance learning and online teaching. At some points, universities were already involved in some

segments of use of technology in their everyday work before the pandemic. Yet, some aspects, like practical teaching and students' practice, were significantly changed. Such significant changes happened at Teaching faculties where future teachers for pre-school education and primary school are educated. A special challenge was the adaptation of Methodics of different subjects and specially Methodics of Physical education. This is mainly due to the importance of practical exercises in frames of PE as well as realization of teaching practices and methodical practice in schools that is obligatory for future teachers. This work gives an overview of the main approaches that were applied when it comes to online teaching of Methodics of PE. The presentation involves several examples of good practice, approaches that were applied and the manners how they were implemented in the program. Opinions of the students, as most relevant are also considered and presented. Their suggestions for future improvement of teaching practice after pandemic are also elaborated.

S5

ACUPUNCTURE ENHANCING THE ATHLETICS PERFORMANCE

Carlos Pernabuco
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Studies have demonstrated the positive effects of acupuncture on athletic performance. The level of resting serum lactate is a potential predictor of muscle exertion during training or competition (1, 2). In this respect, high-intensity activities, like nearly all sports competitions, accumulate lactate due to cellular energy metabolism, which is unable to mobilize the entire amount of pyruvate produced for the Krebs cycle. As such, lactate dehydrogenase (LDH) action is required to convert this metabolite into lactate for export into the blood, given that the accumulation of one or the other inside the cell compromises adequate cell metabolism (3) The level of resting serum lactate is a potential predictor of muscle exertion during training or competition (1, 2). In this respect, high-intensity activities, like nearly all sports competitions, accumulate lactate due to cellular energy metabolism, which is unable to mobilize the entire amount of pyruvate produced for the Krebs cycle. As such, lactate dehydrogenase (LDH) action is required to convert this metabolite into lactate for export into the blood, given that the accumulation of one or the other inside the cell compromises adequate cell metabolism (3) The aim of this study was to determine the acute effects of acupuncture on heart rate, the perceived exertion scale and lactate levels in recreational athletes. Fifteen competitive males engaged in HIIT. The characteristic was 29.86±2.51 years old, heart rate reserve 59.00±3.33, lactate 3.17±0.50 mM/DL. The subjects were submitted to two exercise sessions. Both training sessions consisted of 10 burpees, 12 thrusters and 14 box jumps (75 cm high) for 12 minutes. Activity intensity was between 85 and 95% of maximum heart rate. Acupuncture points: ST36, L3, LI11. The student's t-test was adopted, Shapiro-Wilk test was applied for normality, and Pearson correlation. There was a positive correlation of $r = 0.69$ between lactate levels and heart rate. Lactate: Lac1 15.00±1.18 – Lac2 19.59±1.46 $p = 0.0001^*$; Heart rate: HRF 163.71±7.27 – HRF2 177.60±6.99 $p = 0.0001^*$; Blood pressure: SBP1 174.86±1.57 – SBP2 180.86±1.77 $p = 0.0001^*$; PES1: 19.4±1.14; PES2 16.8±0.84 $p = 0.0001^*$; weight1 – 182,57±12,05; weight 2 206,43±11,39 $p = 0.0325^*$. Acupuncture increased lactate

accumulation, heart rate and blood pressure, suggesting that the exertion reached after acupuncture is higher than without acupuncture. The acupuncture technics will improve the athlete performance. On this case, we suggest use this practice thirty minutes before the work out or race. It will allow the effects of acupuncture during the activity.

S6

AN INNOVATIVE INTERVENTION PROGRAM ON MOTIVATION AND INTENTION TO BE PHYSICALLY ACTIVE: THE LUDOTECHNICAL MODEL

Alfonso Valero Valenzuela
University of Murcia, Spain

The Ludotechnical Model-based program by Valero & Conde (2003) has been designed as an innovative pedagogical model for the initiation to athletics with the intention of overcoming traditional methodologies, characterized by a more analytical sport practice. This model prioritizes the motor domain together with the cognitive for the learning of athletic technique. However, it also focuses on the affective and social domain through the ludotechnical and whole proposals. This research proposes the implementation of the ludotechnical model in technical learning, competence and motivation for teaching different sports (basketball, handball, etc.). For this aim, teachers will receive an instructional course for being an expert in this approach, applying it to an experimental group aged between 10 and 14 years old for at least 16 lessons. The results will be contrasted against a control group. Indicators referring to motivation, physical self-concept, resilience, basic psychological needs and teacher's autonomy support style will be assessed. In order to know the perceptions of teachers and students, qualitative analyses will be carried out with semi-structured interviews at the end of the project, and lesson recordings will also be available to carry out an analysis from an observational methodology. Improvements are expected in students' motivation and intention to be physically active, as well as in teachers' satisfaction with its implementation. Finally, suggestions will be collected from students and teachers to continue improving the physical education teaching education.

S7

STRATEGIC OBJECTIVES FOR DEVELOPMENT OF STUDENT SPORTS IN THE RUSSIAN FEDERATION

Roman Olkhovskiy¹
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In the last decade, the Russian authorities have launched many initiatives aimed the Russian Federation has taken measures aimed at consolidating the system of student sports, physical education and recreational activities within vocational and higher education.

Major sporting events, such as Summer and Winter World Universiades held in 2013 and 2019, Winter Olympics in 2014, FIFA World Cup in 2018, have greatly contributed to this goal. As university sports continues to develop in the Russian Federation, the legal framework regulating this sphere is also

actively expanded. The documents regulating student sports were included into federal legislation in 2011, with further regulations on physical culture, sports and recreational work added in 2012. Modifications detailing the jurisdiction of the Russian Student Sports Union and regions of the Russian Federation regarding student sports were introduced in 2018, also regulating the procedure for establishing student sports leagues. The report considers the key goals and objectives for student sports up to 2030, as well as the main results achieved by 2020, accompanied by analysis of objective and subjective difficulties faced by state and non-governmental agencies interested in supporting student sports during the pandemic.

S8

EVOLVING ENVIRONMENTS, PERFORMANCE AND HEALTH

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Ability to adapt and resolve critical situations is key for success in nature. In sport leagues with a highly competitive balance, teams evolve in this environment by modifying their game flow design as other evolving natural systems. Collaboration-opposition sports present a critical profile. Nonlinear local player interactions seem to be chaotic, but are reflected in an order parameter, which points out critical points and phase transitions to new states, as human body regarding performance and health. Teams develop strategies in order to take the lead, and rivals do the same, simultaneously and continuously during game time, which can be considered as a Red Queen Hypothesis. They modify their design and flow, from a diffuse flow to a hierarchical flow, when exceed a critical point. Therefore, teams would be considered as self-organizing systems. A persistent problem in biological and social sciences is to understand the conditions necessary for the emergence and maintenance of cooperation in evolving populations. This ability, for improving individual performance, teams' behavior or health, can be trained using holistic training: designing tasks with nonlinear outputs (several valid solutions) progressing from exercises of great symmetry (more mechanized); to lower symmetry exercises (less mechanical), performed in a critical state, between success and error, using uncertainty as catalyst of this process.

ABSTRACTS

A1

INFLUENCE OF SWIMMING TRAINING ON FOOT PRONATION IN YOUNG SWIMMERS

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INTRODUCTION: Limited pronation of the foot is associated with the development of several diseases of the musculoskeletal system. However, little is known about the effect of swimming on foot pronation.

AIMS: The main aim of study was testing pronation of foot in young swimmer with different swimming training period.

SAMPLE: The sample consisted of 112 young swimmers who participated in a swimming sports camp in Banská Bystrica. The children were divided into five groups, depending on years of swimming training they had completed

METHODS: The navicular drop test was chosen for testing foot pronation. The navicular drop test is test in a closed kinematic chain under axial load.

Results: The mean pronation of foot in the group that had completed a year of swimming training was 0.41 (SD±0.18) on the right foot and 0.44 (SD±0.22) on the left foot. After two years of swimming training pronation was 0.67 (SD±0.28) on the right foot and 0.63 (SD±0.31) on the left foot. After three years of swimming training pronation was 0.69 (SD±0.39) on the right foot and 0.77 (SD±0.33) on the left foot. After four years, 0.80 (SD±0.29) on the right foot and 0.83 (SD ± 0.35) on the left foot. Pronation in non-swimmers was 0.35 (SD 0.29) on the right foot and 0.35 (SD±0.23) on the left foot. In the group of swimmers who were swimming training for a longer time, a significantly higher range of pronation was recorded compared to those who did less ($p < 0.05$).

CONCLUSION: A higher range of pronation foot was observed in young swimmers who trained longer time compared to young swimmers who trained for a shorter period.

KEYWORDS: Swimming, Naviculare Drop Test, Pronation Foot, Young Swimmer

A2

EXPLORING PHYSICAL ACTIVITY OF FEMALE SECONDARY SCHOOL STUDENTS FROM SELECTED REGIONS OF SLOVAKIA

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INTRODUCTION: The physical activity is gaining its importance and significance nowadays, even more than ever before. The relationship towards the physical activity is formed throughout life and its basis is formed during the period of adolescence. The aim of the survey was to analyse and compare the physical activity of female secondary school students from selected regions of Slovakia. **METHODS:** We obtained the data through the survey which was distributed during the months of February to December, 2019. To obtain the representative sample of secondary schools, we selected the female students from grammar schools and secondary vocational schools from 5 regions of Slovakia, in total number of 1972. The average age of respondents was 18,68 years. We analysed the survey, in terms of individual regions, by chi-square test at significance level of $p < 0.01$ and $p < 0.05$.

RESULTS: During the working week, on average of 52.43% of female students have free time in range of 1 to 3 hours. During the weekend, we recorded the largest changes in range of free time, compared to hours of working week, in survey item > 5 hours/ day at level higher than 40% in regions of Banska Bystrica, Kosice, Presov and Zilina. In region of Bratislava, the increase was only 11% (statistically significant at level of $p < 0.01$). The female students of Bratislava Region spend their free time passively (60.62%), while the female students of regions of Kosice (60.25%) and Banska Bystrica (56.57%) are active.

CONCLUSION: The significant difference of female students of Bratislava Region, compared to female students of other regions of Slovakia surveyed by us, was also recorded in other survey items, such as dominant area of interest of realising the physical activity, nature of realising the physical activity and reason of not realising the physical activity. The listed region is considered to be the economically richest, with the lowest unemployment rate. The research was funded by the grant KEGA 012UMB-4/2019.
KEYWORDS: Physical Activity, Girls, Secondary School Students

A3

INFLUENCE OF MATCH FATIGUE ON COUNTERMOVEMENT JUMP PERFORMANCE IN WOMEN BASKETBALL PLAYERS

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INTRODUCTION: Fatigue of the central nervous system in a match leads to the influence of several motor skills. However, little is known about the effect of match fatigue on post-match countermovement jump performance.

PARTICIPANTS: The sample consisted of 12 women basketball players from the UMB Banská Bystrica university basketball team. The mean age of the group was 23 (SD ± 2.69). A mean height for basketball players was 174.69 cm (SD ± 2.69) and a mean weight was 65 kg (SD ± 9.14).

METHODS: Women basketball players were tested before and after the match. A countermovement jump was used for testing. Countermovement jump is a practical, valid, and reliable method for measuring the explosive power of the lower body. Performance in a countermovement jump is associated with maximum speed, maximum strength and explosive power. The countermovement jump was tested using OptoJump.

RESULTS: The mean result countermovement jump before the match was 28.14 cm (SD ± 4.55). The mean result after the match was 30.2 cm (SD ± 5.50). There was a significant difference after the match in favor of post-match performance testing (p=0.03)

CONCLUSION: Better countermovement jump performance was recorded after the match. Fatigue of the central nervous system during the match did not lead to a negative effect on the performance of the countermovement jump.

KEYWORDS: Fatigue, Countermovement Jump, Basketball

A4

GRADUATENESS AND SPORTS COACHING: A PRELIMINARY STUDY OF COACHES' BEHAVIOUR USING THE REVISED ARIZONA STATE UNIVERSITY OBSERVATION INSTRUMENT

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INTRODUCTION: This project aimed to identify if there were differences in coaching behaviours between coaches trained and educated in less-academic, traditional, governing

body of sport approaches (n=6) and those who were educated and trained through Higher Education routes (n=6).

METHODS: Data were gathered from twelve coaches by videoing and audio-recording coaching sessions. The data were analysed using the REVISED ASUOI observation tool, employing an independent-samples t-test to establish differences between the graduate coaches and non-graduate coaches across each of the behaviour categories.

RESULTS: Differences were identified in five categories – Learning Intention, Closed Questioning, Open Questioning, Coaches' Model, and Observation. Graduateness as outlined by Coetzee (2014), was proffered as an explanation of differences.

CONCLUSION: Further work is suggested using conversational analyses to provide a more subtle and nuanced examination of the coaches' vocabularies and judgements as they communicate.

KEYWORDS: Coach Behaviour, Coach Education, Graduate, Football, Higher Education

A5

GATEWAYS AND GATEKEEPERS: TWO FACTORS THAT INFLUENCE THE USE OF PERFORMANCE AND IMAGE ENHANCING DRUGS (PIEDS) AMONG UK MILITARY VETERANS

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INTRODUCTION: There are many underlying motives for taking performance and image enhancing drugs (PIEDs). Recent reports have identified that PIEDs use is rising within the Armed Forces leading to concerns over health and concomitant operational risks. The aim of this study was to identify factors that underpinned PIEDs use among a cohort of UK military veterans to ascertain what factors influenced their use when in-Service.

METHODS: Semi-structured interviews were conducted with 14 ex-Service personnel. Interviews were transcribed verbatim and thematically analysed using NVivo12 software.

RESULTS: Common themes were identified around the ways in which the veterans were introduced to PIEDs and how they accessed them. Gatekeepers included friends, colleagues, and mentors. Gateways included excessive gym use, the need to cope with fitness demands of military service, and previous experiences with nutritional and body-building supplements.

CONCLUSION: Recommendations include the need for improved education for Service personnel particularly on stronger messages about the potential negative health consequences of PIEDs use, and ongoing training for military fitness personnel to identify the signs of excessive training and/or PIEDs use.

KEYWORDS: PIEDs, Motivation, Military, Veterans, Armed Forces

This project was funded by the Forces in Mind Trust, London, UK.

THE VISUAL HAND REACTION TEST AND COMPLEX HAND-FOOT-REACTION TEST FROM WERTHNER'S TALENT DIAGNOSTIC SYSTEM: CONSTRUCT VALIDITY AND TEST-RETEST RELIABILITY IN HEALTHY OLDER ADULTS

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INTRODUCTION: The visual hand reaction test (VH-RT) and complex hand-foot reaction test (CHF-RT) from Werthner's Talent Diagnostic System allow the acquisition of visual reaction parameters in a close to everyday-life situation. Therefore, both tests may be useful not only in the talent diagnostics in adolescents, but also in the screening of cognitive impairments in later adulthood. The aim of this study was to investigate the construct validity and test-retest reliability of the VH-RT and the CHF-RT among a sample of healthy older adults.

METHODS: Participants completed the VH-RT, the CHF-RT and the well-established visual reaction test S1 (VRT-S1) by Schuhfried on one occasion. Five weeks later, measurements of VH-RT and CHF-RT were repeated. Pearson's correlation coefficients were calculated based on log-transformed data.

RESULTS: Fifty-eight healthy older adults (50% female, mean age 66.7±4.1 years) completed the study. Moderate relative agreements were found for both the VH-RT ($r=0.46$) and the CHF-RT ($r=0.61$), when compared with the VRT-S1. Test-retest reliability was acceptable (VH-RT: $r=0.70$; CHF-RT: $r=0.82$).

CONCLUSION: Both the VH-RT and the CHF-RT showed satisfying construct validity and test-retest reliability. However, further studies with larger and more heterogeneous samples of older adults are needed.

KEYWORDS: Validity, Reliability, Reaction Time, Older Adults

THE ROLE OF PHYSICAL EXERCISE IN SHAPING A HEALTHY LIFESTYLE AMONG YOUNG PEOPLE

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INTRODUCTION: According to scientific data, human health depends on 20% of hereditary factors, 20% on external conditions (ecology), 10% on the activities of the health care system and 50% is determined by the lifestyle that he leads, the culture of health.

The foundation for health and a positive attitude towards exercise is laid during childhood. Every year the health of the younger generation is gradually deteriorating, which indicates the need to take urgent measures to improve the health of children and adolescents.

Childhood is the time when tendencies of human physical development are laid, it is at this time that environmental factors have the greatest influence on the body. Therefore, it

is so important that parents devote a lot of time to the child's health, to form a focus on a healthy lifestyle in his future. The creation of an atmosphere of priority and even prestige of health in society is within the power of every family.

One of the methods of instilling a love of a healthy lifestyle is to exercise regularly. The aim of this work was to clarify the role of physical exercise in the formation of a healthy lifestyle in the younger generation.

METHODS: Analysis of scientific and methodological literature, analysis of regulatory documents, archival materials, interviewing individuals from different social groups about the importance of maintaining a healthy lifestyle

RESULTS: After conducting a survey among children in a comprehensive school "What do they like to do in their free time?", we found:

Children's answers	Number of persons (%)
We play games on the phone (tablet, computer)	45 children (57,7%)
We are engaged in creativity (we draw, sculpt, make an applique, etc.)	21 children (26,9%)
We walk, play outdoor games	12 children (15,4%)

After conducting a survey among children in a sports school "What do they like to do in their free time?", we found:

Children's answers	Number of persons (%)
We play games on the phone (tablet, computer)	28 children (34,6%)
We are engaged in creativity (we draw, sculpt, make an applique, etc.)	16 children (19,7%)
We walk, play outdoor games	37 children (45,7%)

CONCLUSION: Thus, physical exercises, an active motor regime are of great importance in the formation of a healthy lifestyle, spiritual and physical development of the younger generation. Regular physical exercise strengthens health, increases neuropsychic resistance to emotional stress, maintains physical and mental performance, being a preventive means of maintaining and strengthening health and preventing various non-communicable diseases and bad habits, thereby forming a healthy lifestyle.

KEYWORDS: Healthy Lifestyles, Exercises, Physical Exercises, Human Health

MEASURING LOCOMOTOR TRAINING PERFORMANCE WITH MECHANICAL PERFORMANCE AND MOTORIC TESTS IN THE CASE OF YOUNG SOCCER PLAYERS

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INTRODUCTION: The monitoring of young soccer players' training load using up-to-date devices is essential from the point of view of continuous improvement at high-quality soccer academies.

METHODS: Data measured in the U15–U19 age groups at the Illés Academy in Szombathely were analyzed during the research (N = 70). These data comprised (a) body parameters and performance trials: Body Mass, Height, Yo-Yo intermittent recovery test–level 1 (YYIR1), 30 m running, Functional Movement Screening (FMS), and Standing Long Jump (SLJ). (b) Locomotor parameters using the 6-week averages of Catapult OptimEye S5 standardized weekly reports of locomotor performance data (weeks 42–47, 2019). We processed the data using IBM SPSS Statistics 25 (p < .05). We carried out linear regression analysis, one-way analysis of variance (ANOVA), and correlation matrix analysis, besides descriptive statistics.

RESULTS: The Illés Academy players did well in the motoric tests: YYIR1 (2155 ± 311; m), 30 m (4.34 ± 0.26; sec), and SLJ (2.28 ± 0.18; m), and the different age groups underwent dynamic improvement. The young soccer players ran 19,552 ± 4,62 m on average in their weekly training sessions players ran 568, 298, and 97 m in the moderate-, high-, and sprint-intensity zones (Velocity Band 4–5–6 Average Distance) (±287, 148, and 67 m). High-intensity correlations were found between the completed total distance and the number of moderate-intensity actions (r = 0.806, p < .001), and high correlations were found between the moderate-intensity and high-intensity running (r = 0.933, p < .001).

CONCLUSION: In the present study, we analyzed the data for U15–U19 soccer players. It is important to analyze periodicity, load, and the differentiation of the various training parameters in the case of the different age groups.

KEYWORDS: Young Soccer Players, Catapult Locomotor Performance

A9

ANALYSIS OF THE POSSIBILITY OF CERTIFICATION OF FITNESS TRAINERS TAKING INTO ACCOUNT THE REQUIREMENTS OF THE PROFESSIONAL STANDARD “SPECIALIST IN PROMOTING FITNESS SERVICES” IN RUSSIA

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INTRODUCTION:

Among the various professions in the field of physical culture and sports, for several decades now, is the profession of a fitness trainer (instructor). This profession includes extensive knowledge of various areas of fitness, the characteristics of training activities and the health benefits of training. At the same time, fitness classes are often associated with a high degree of injury due to inadequate knowledge and skills of instructors in the field of the fitness industry. Insufficient education of fitness trainers (instructors), low availability of scientific and methodological literature for the training process of fitness trainers (instructors) are the main reasons for poor quality training of specialists in this industry. At present, the professional standard “Specialist in the promotion of fitness services” has been developed, which regulates the activities of a fitness trainer (instructor) and imposes certain requirements on

the level of preparedness of graduates in higher education programs and the qualifications assessment system. The nature and characteristics of professional activity, the specificity of training a future specialist in this field are not always interrelated. There is a great isolation of practical requirements and needs of society from theoretical material in the preparation of a fitness instructor. There is also some underdeveloped fitness instructor certification process, as is the case in Europe. In this regard, we have proposed a model for certification of a fitness instructor (trainer) in accordance with the Professional Standard “Specialist in the Promotion of Fitness Services”.

PURPOSE: Substantiate the content of test and practical tasks for a fitness instructor as part of their certification, taking into account the standard “Specialist in the promotion of fitness services”.

METHODS: The study used testing methods based on the Moodle platform.

RESULTS: In the process of pedagogical research, we determined the criteria for assessing a future specialist in the field of the fitness industry with the subsequent classification of knowledge, skills and abilities. Based on the results obtained, we have developed a two-stage assessment: theoretical and practical. As a result of such an assessment, the specialist receives the sum of points, which characterizes the degree of his preparedness. So, on average for the group, the grade for the program was 17.58 points out of 25 possible, which corresponds to 70.32%. It can be stated that students have mastered this labor action. The main remarks on the program are related to the lack of methods of organization and methodological techniques, methods of teaching and organizing students. On average for the group, the comments were 5.93 ± 0.55 points (V (%) = 20.72), this was 23.72%. Most often, students ineffectively used the acquired knowledge associated with the ways, methods and methodological techniques of teaching and organization of those involved in the course of the classes. It is possible to note a high level of discrepancy between the content of the program and the conduct of the lesson on this aspect, that is, if the methodological methods of organizing and educating the students were not described in the synopsis, then during the lessons the students used them, respectively, less deductions were received for this component - 0, 83 ± 0.12 points.

CONCLUSIONS. Thus, the study made it possible to correlate the knowledge and skills of instructors in labor actions, according to the Professional standard “Specialist in instructor and methodological work in the field of physical culture and sports”. The development of criteria for assessing knowledge and skills, their scoring system of assessment determines the level of fitness of a fitness instructor and, in the future, the possibility of his employment in fitness clubs, taking into account their professional assessment.

KEYWORDS: professional standard, fitness, instructor, trainer, certification, training, labor functions.

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DEVELOPMENT OF A SCALE TO MEASURE MORAL DISENGAGEMENT FOR OCCUPATIONAL GAINS TO ENHANCE OUR UNDERSTANDING OF THE USE OF PERFORMANCE AND IMAGE ENHANCING DRUGS (PIEDS) IN THE WORKPLACE

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INTRODUCTION: PIEDs is a cause of concern for those seeking to prevent immoral behaviours as well as reduce health harms. Originally described by Bandura (1991), moral disengagement refers to cognitive mechanisms that separate our morals from our actions, allowing us to engage in unethical behavior. This has been associated with workplace misconduct with PIEDs used for occupational performance (e.g., private security, police). We propose that moral disengagement may explain the use of PIEDs for occupational gains. In this paper we report the development of a psychometric instrument to assess propensity to morally disengage in the workplace.

METHOD: Eight-four participants (34 PIED and 50 Non-PIED users) from 10 occupations completed an online questionnaire shared via social media. The questionnaire was based on an 8-factor model proposed by Bandura et al (1996) with items adapted from validated scales investigating doping in sport. Twenty items measured the following factors: Moral Justification, Euphemistic Labelling, Advantageous Comparison, Diffusion of Responsibility, Distortion of Consequences and Displacement of Responsibility. Participants completed the questionnaire using a 7-point scale (1 = strongly disagree to 7 = strongly agree).

RESULTS: The questionnaire was confirmed as psychometrically robust and that there was a significant difference between PIED and Non-PIED users. The results identified that PIED users demonstrated higher moral disengagement in an occupational context.

CONCLUSION: The Moral Disengagement for Occupational Gains Scale has demonstrated initial psychometric properties that support its use as a valid and reliable measure of moral disengagement for use in research into the use of PIEDs in an occupational context.

KEYWORDS: Moral disengagement, Performance and Image Enhancing Drugs, Occupation

EXPLORATION OF THE PATTERNS OF AGGRESSION IN ATHLETES IN SPORT GAMES WITH REGARD TO THE PREVIOUS ATHLETIC EXPERIENCE

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INTRODUCTION: The article reports the findings of the experimental research with participation of 'young' (20 people) and 'proficient' (20 people) basketball players. The research

aimed to explore the patterns of aggressive behavior in athletes in sport games with regard to the previous athletic experience. Indicators of a motivational component of aggression were measured with the T. Ehlers diagnostic technique (methodology of personality diagnostics for motivation to avoid failures).

METHODS: Indicators of a cognitive activity component were measured using Hall Emotional Intelligence Test and McLean's Organizational Stress Scale Test. Indicators of an emotional component were measured using Psychological Stress Measure PSM-25 by Lemyre-Tessier-Fillion, Spielberger State Anxiety Scale, Darkie Bass questionnaire, V.V. Boyko's method for emotional burnout assessment. Indicators of a personal component were measured with the Life Purpose Orientations Test by D.A. Leontiev.

RESULTS: The study revealed a number of parameters distinguishing 'proficient' athletes from 'young' athletes. These are high values of indicators of motivation for success and emotional intelligence; medium values of indicators of situational and personal anxiety; low values of indicators of organizational stress and psychological strain; low values of indicators of manifestation of indirect, verbal, and physical aggression; high values of indicators of anger, negativism, and hurt feelings; low values of indicators of the emotional burnout syndrome; high values of indicators of Life Purpose orientations.

CONCLUSION: Sport activity is a significant positive factor of the development of personal abilities to regulate manifestation of aggression, due to the development of personal characteristics ensuring their optimal level, constructive orientation, positive emotional range, and personal significance.

KEYWORDS: sport activity, manifestation of aggression, 'young' and 'proficient', components of aggression, sport games, basketball.

THE LEVEL OF MOTIVATION IN RHYTHMIC GYMNASTICS DURING SARS-COV-2 PANDEMIC

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INTRODUCTION: The SARS-CoV-2 Pandemic has caused substantial changes in sports training. During the lockdown, in Romania (March 16- May 15 2020), and in different other periods when the gym halls were closed, rhythmic gymnastics like others sports had to be practiced online at home or outdoor. This led to the fact that important abilities have been deeply affected such as: muscular strength, mobility, flexibility and mostly body and apparatus technique such as body difficulty(BD) apparatus difficulty(AD) and quality of execution. Among these skills, the pandemic affected the psychological status, the motivation in particular. The aim of this study is to establish the level of different motivation types among rhythmic gymnasts.

METHODS: Seventeen female (aged=12.92±1..58 years) national level rhythmic gymnasts, voluntarily participated in the study and their motivation was evaluated by applying online the Sport Motivation Scale 2 (SMS-2) in September 2020.

RESULTS: in terms of intrinsic motivation (average=15.41± 0.71 points, 96.41%; total 16 points) means happiness,

enthusiasm and personal satisfaction for practicing rhythmic gymnastics; extrinsic motivation represented by the subclasses: integrated regulation, identified regulation and introjected regulation (average=14.7±1.64 points, 75%; total 16 points), and external regulation(average=11.23±1.48 points, 50%; total 16 points) is affected by the current situation; for amotivation (average=11.23±1.48 points, 50%; total 16 points), the results denotes the lack of desire to continue to practice rhythmic gymnastics.

CONCLUSION: The current situation and the motivation of the athletes are closely related. In general, athletes feel happy and they were satisfied by practicing rhythmic gymnastics. However, under the current conditions, extrinsic motivation and amotivation are directly negative affected.

KEYWORDS: Motivation, Rhythmic Gymnastics, SARS-CoV-2 Pandemic

A13

RECONSTRUCTING LOCOMOTOR TRAJECTORIES AT HOME FROM A CAPACITIVE SENSORY FLOOR WITH APPLICATIONS IN HEALTH AND WELLNESS

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INTRODUCTION: How we walk at home, in a restricted and cluttered environment, reveals crucial information about locomotor efficiency and wellness. Gait trajectory, walking metrics and space occupancy are for instance useful markers of our daily locomotor routines which are informative about well-being. The goal of this study was to detect, reconstruct and identify locomotor trajectories during walking at home with a capacitive sensing system, the SensFloor.

METHODS: The study was conducted in an apartment located in the centre of Montpellier in the south of France. Data were first collected in controlled linear and curvilinear walking scenarios performed by three participants. These data allowed the construction of the processing algorithm through the following the steps: (i) defining the static graph of the apartment, (ii) identifying spatio-temporal neighbourhoods from ground activation, (iii) data filtering, (iv) trajectory reconstruction from the chains of dynamic nodes allowing finally (v) identification of walking metrics: locomotor distance, time and speed. In a second phase, our algorithm was tested on a full day of real occupancy by one single inhabitant.

RESULTS: The results demonstrated the effectiveness of our algorithm in identifying locomotor trajectories within the apartment. A random one-day file extracted from the database revealed 529 individual trajectories, computed from 100,490 floor activation contacts. Trajectories were produced with an average speed $\mu_v = 1.4$ m/s, for an average travelled distance (per trajectory) of $\mu_l = 14.5$ m and an average walking time of $\mu_d = 9.4$ s. Each identified trajectory had an average of 50 activations. In addition, the extracted temporal

information showed a dominant occupancy of the living room and room 1, for a total travel time of 8.21%.

CONCLUSION: The success of our algorithm in detecting trajectories and identifying metrics of interest now allows us to explore locomotor walking habits in real-life conditions, and in the face of current problems such as home confinement related to Covid-19.

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KEYWORDS: Locomotor trajectories, Walking at Home, Occupancy, Sensing floor, Capacitive sensor, Algorithm, SensFloor, Wellness

A14

OHMTRAK - A NOVEL OPTION OF MEASUREMENT IN SPORTS REHABILITATION

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Examination in sports rehabilitation is a great challenge. OhmTrak provides a novel option for the assessment of intra-abdominal pressure. OhmTrak is a wireless device used with a built-in force sensor measuring 15 mm x 0.35 mm. The sensor is attached to the abdominal wall with the help of adjustable straps or belts to read the force vector of the abdominal wall expansion. The recorded force is converted into a digital signal and transmitted to the computer or mobile device via the Bluetooth interface. PC or mobile-based application displays the corresponding force waveform in real-time. The device is also equipped with an accelerometer sensing detecting direction and intensity of the trunk movement. The main objective of this article is to demonstrate the potential use of this type of measurement in clinical practice.

KEYWORDS: OhmTrak, measurement device, low back pain

A15

INJURIES IN SPORTS-MASS ORIENTED RHYTHMIC GYMNASTICS

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INTRODUCTION: This article discusses a highly relevant topic, sports injuries in children. Serious injuries in schoolchildren have been reported according to recent research. 38 to 48% of children are injured in everyday life during a year. Of these, 4% are sports-related injuries. There is continued interest in sports-mass oriented rhythmic gymnastics. Thousands of girls across the country are involved in the training system. However, if training rhythmic gymnasts, which seeks the achievement of higher levels of sports results, is sufficiently streamlined (which is evidenced

by the successes of Russian female athletes), training sports- mass gymnasts, by contrast, is an intuitive activity reproducing the model of high-level sports. This, firstly, fails to address the major challenges of sports-mass training and, secondly, makes it unsafe to do the training.

The study aims to identify the causes behind the injuries and find the ways to prevent injuries in girls practicing sports-mass oriented gymnastics.

METHODS: reviews of specialist literature, documentary and archival materials; reviews of medical records from a physical culture and sports dispensary; interviews with coaches and athletes; coaches' observations; ranging; processing of obtained data.

RESULTS: An interview with 258 respondents (48 coaches and 210 athletes) and a review of 210 medical records on file with a physical culture and sports dispensary have registered 792 injuries in gymnasts under study throughout 2017-2020.

The study has ascertained the frequency, location, and severity of injuries, as well as the causes and factors behind injury. An in-depth review of the interviews and coaches' observations has allowed ranking the causes and circumstances behind injuries in sports-mass oriented rhythmic gymnastics. Injuries are mainly caused through grouping students incorrectly, trying to have insufficiently trained gymnasts perform complex stunts, or putting too much strength into training activities, which is beyond the purpose of mass sports.

The study has also allowed us to find the ways to reduce and prevent sports-related injury levels in children.

CONCLUSION: The study has generated materials that, upon a review, have led to a conclusion of the importance of revisiting the training process in sports-mass oriented gymnastics with a view of reducing injuries and raising a physically and mentally healthy generation.

KEYWORDS: sports-related injuries, causes, prevention, sports-mass oriented rhythmic gymnastics.

A16

ESTIMATION OF EXERCISE TOLERANCE IN BIKE TRACK RACING BASED ON ANALYSIS OF HEART RATE VARIABILITY IN ATHLETES OF VARIOUS LEVEL OF TRAINING

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INTRODUCTION: Assessment of the tolerance of the training load by cyclists who participate in track races is a significant indicator of the adaptive reactivity of the athletes' bodies. The circulatory system of athletes, during cycling races on the track, is subject to colossal functional loads, both during training work and during competitions. In this regard, the systematic control of the tolerance of the training load by cyclists is an objective factor in the management of their sports training.

The basis of the training process of female cyclists is adaptation to the effects of physical activity, which has a stimulating effect on the course of adaptive reactions of the organism of female athletes in preparation for the competition. The adaptive reactivity of the body of athletes is manifested in the

improvement of trophic, regulatory and transport functions of the circulatory system.

METHODS: When assessing the tolerance of the training load by the body, it is advisable to take into account the state of the mechanisms of nervous and neurohormonal regulation of the circulatory system. The effectiveness of the synergy of the nervous and neurohormonal regulation of the circulatory system of female cyclists can be judged by the results of fractal analysis of the heart rate based on the study of the variability of the cardiographic signal. Studying the interaction of the nervous and hormonal regulation of the heart rate of female cyclists of different fitness levels will help solve the problem of exercise tolerance.

RESULTS: The article discusses the fitness indicators of female athletes in different phases of the basic preparatory mesocycle of training. A necessary list of heart rate variability indices has been formed, characterizing the degree of tolerance of the training load by cyclists during preparation for competitions on the track. A procedure has been developed for testing the characteristics of the heart rate variability at rest and during the aftereffect of physical activity on the body of cyclists. The results of the influence of the nervous and hormonal regulation of the heart rate on the fitness state of female cyclists are presented. It has been proven that the main indicator of the fitness level of female cyclists is the synchronization of the influence of the nervous and hormonal components of the regulation of the heart rate. A high degree of synchronization of both components of heart rate regulation testifies to the adequacy of physical activity to the adaptive reactions of the female cyclists' bodies.

CONCLUSION: The results obtained allow us to recommend the assessment of the degree of synchronization of the nervous and hormonal components of the regulation of the heart rate as the main indicator of the exercise tolerance of cyclists.

KEYWORDS: Cyclists, Bike Races on the Track, Indicators of Heart Rate Regulation, Level of Fitness, Exercise Tolerance

A17

SPECIAL TRAINING OF RIDERS ON THE HIGHWAY, TAKING INTO ACCOUNT THE TYPES OF ENERGY METABOLISM

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INTRODUCTION: The competitive activity of racers on the highway makes high demands on the level of their physical fitness, since the competition can be held in the form of a multi-day race. The training of road racers is based on the development of physical qualities, among which the most important for them are different types of endurance. The development of these qualities is possible only with a purposeful impact on their physiological systems and, in particular, on the mechanisms of energy supply of muscle activity.

METHODS: The analysis of the literature showed that in most of the works devoted to the preparation of racers on the highway, there is no necessary scientific information characterizing the features of the energy supply of their muscular activity during preparation for multi-day races. This

greatly limits the possibilities for differentiating the means and methods of developing different types of endurance in the process of training. The issues of application of methods for the development of endurance among racers on the highway, where the differentiation criterion would be different types of energy metabolism, are also insufficiently developed. The existing system of preparation of racers on the highway for competitions is characterized by insufficient consideration of the peculiarities of the mechanism of energy supply of muscular activity in the training process. Its main drawback is its general approach to training road riders. Coaches in their work with athletes are guided solely by their personal experience of preparing road riders for competitions. This does not allow to effectively develop general and speed endurance among racers on the highway, which are necessary for athletes to conduct effective competitive wrestling.

RESULTS: The conducted research shows that the means and methods of training racers on the highway, taking into account the type of their energy metabolism, play a significant role in increasing the effectiveness of preparation for the competition. This really helps athletes to achieve better results in the training process and in competition. It was found that training sessions, taking into account the type of energy metabolism, are more effective. Studies have shown that the success in preparing athletes for competitions largely depends on taking into account the individual characteristics of the mechanism of energy supply of muscle activity. For the training of racers on the highway, the solution of special tasks for the development of tempo and speed endurance is characteristic. Pace endurance is necessary for athletes to maintain high speed during the race on the highway, and speed endurance is necessary for them to build up speed at the finish line of the race. And the longer this finishing spurt is, the higher the athlete's final result will be.

CONCLUSION: Studies have shown that special tasks during such training should be solved taking into account the type of energy metabolism in road racers. The article presents the results of studies on the development of the content of a model of training for road racers, taking into account the type of their energy metabolism.

KEYWORDS: Road Racers, Training Model Taking into account the Type of Energy Metabolism, Content of the Training Process in Preparation for the Competition

A18

PRACTICES OF PEDAGOGICAL SKILLS IN THE IMPLEMENTATION OF COURSES IN THE FIELD OF PHYSICAL EDUCATION AND SPORTS IN A DISTANCE FORMAT

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INTRODUCTION: In modern conditions, no one doubts that physical culture and sports are useful and necessary for every person. As the period of forced isolation under COVID-19 conditions (spring-summer 2020) showed, even in these conditions, people continued to engage in physical education and sports.

METHODS: For students of educational institutions,

including higher educational institutions, a large number of videos were created and posted on the Internet about what exercises and how to perform. However, at the same time, few people paid attention to such an equally important aspect as the theoretical foundations of physical culture and sports, the knowledge of which allows you to correctly distribute your load, monitor the impact of the load on the body, choose from the proposed exercises those that are shown to a particular person. All this makes us once again talk about the need to support and create high-quality and professional electronic resources that systematize knowledge in this area.

RESULTS: A team of SPbPU authors have developed and introduced into the educational process of MOOC courses "Physical culture" in 2016, "Fundamentals of the training process of cybersportsmen" in 2020, posted on the National portal "Open Education". The Physical Education online course can be one example of organizing such resources. Today (and especially during a pandemic) this is one of the most popular courses with a massive audience. At the Polytechnic University, it is involved in all curricula and is compulsory for all students. Our research is devoted to further prospects for the development of the resource. Of course, it is very difficult to define the concept of "pedagogical skill" in the context of this article. However, we tried to do this, highlighting the main, from our point of view, the criteria of pedagogical excellence, which are necessary for the high-quality implementation of courses in a distance format.

CONCLUSIONS: The online resources we have created allow us to stimulate and motivate students for personal development, organize their educational activities, including building a training system, organize pedagogical activities, monitor the success of students' development of resources, and structure classes. The implemented system made it possible to organize training during the COVID-19 pandemic without interruptions and without reducing the quality of education.

KEYWORDS: Teaching Skills, Online Courses, Physical Education, Distance Learning

A19

THE USE OF THE VIBROACOUSTIC SYSTEM FOR DETERMINING THE RANGE OF A SKI JUMP FOR TRAINING ATHLETES

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INTRODUCTION: The vibroacoustic system for determining the distance of a ski jump can be either additional to the existing video systems, or an alternative. The fully automated system allows coaches to receive data on the acceleration speed and jump range in real time during the training process, create a database of results, plan the training process, pay attention directly to the athlete's training process, and thereby improve the quality of training of jumpers.

METHODS: The system uses accelerometers or fiber-optic vibration sensors, analog-to-digital converters, data collection system, network computer equipment and external display devices- display boards. The system is equipped with a remote start control, which allows coaches to ensure the safety of the training process of athletes when performing ski jumps. It is possible to transfer data to the trainer's tablet computer.

RESULTS: The system for determining the distance of a ski jump was created and tested on the K40 and K75 ski jumps in the village of Toksovo, Leningrad Region. The accuracy of determining the jump range was approximately 0.5 m. The analysis of the data obtained during the pilot operation is carried out, and the ways of improving the system are determined.

CONCLUSION: The developed vibration-acoustic system can be used in the training process to determine the distance of a ski jump with an accuracy of 0.5 m.

KEYWORDS: Ski Jumping, Vibroacoustic System, Jump Range, Coaching, Exercise

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A20

JUSTIFICATION AND APPROBATION OF OPTIMAL RESPIRATORY REGIMES IN STUDENTS IN MARTIAL ARTS CLASSES

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INTRODUCTION: Studies carried out during the period of students' competitions in various types of combat sports have revealed a high degree of correlation between the efficiency of external respiration (EER) in athletes. The highest indicators of the relationship between the efficiency of external respiration and sports results were observed in wrestlers of the classical type. In order to substantiate the optimal and regulated breathing regimes in athletes who were engaged in various types of martial arts, we conducted research, in which 36 students took part.

METHODS: The research was carried out in two ways. In the 1st variant, abdominal breathing was performed with inhalation resistance created by the tension of the muscles of the larynx and bronchi; exhalation was normal. During the

period of such regulated breathing, pulmonary ventilation (PV) decreases by 46.4% at $P < 0.01$. In the second variant, breathing was performed with a prolonged exhalation, with maximum resistance on exhalation (tightly clenching the lips, puffing out the cheeks), inhalation was normal. The study was carried out in accordance with the PRISMA recommendations.

RESULTS: The results obtained in the course of the experiments indicate that during the periods of using the recommended breathing modes (RBM) in training sessions, there is a significant decrease in Exc CO₂, which is characterized as a criterion for assessing the intensity of physical activity, and can completely replace the indicator of lactic acid, an increase in which is the main limiter of such a load.

CONCLUSION: In the course of the research, it was possible to establish and develop regulated breathing regimes, and in the course of the pedagogical experiment to confirm the assumption that the recommended breathing regimes develop endurance as a basic physical quality in athletes, especially in wrestlers. The test subjects' indices, established in the course of the experiment, confirm the reliability of the results obtained, and the use of regulated breathing regimes contributes to an increase in the effectiveness of the educational-training process in various types of wrestling.

KEYWORDS: Combat Sports, Regulated Mode, Physical Activity, Efficiency Of External Respiration, Oxygen Consumption, Exercise, Cognitive Health

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A21

THE RELATIONSHIP OF RESILIENCE AND ANXIETY IN VOLLEYBALL

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INTRODUCTION: The purpose of this study was to investigate the relationship between resilience levels and anxiety of volleyball players and to find possible differences that exist between the two genders. Participants included 195 volleyball players (37 male and 158 female), with the Self Evaluation Resilience test and the CSAI-2 test (Greek version) used as evaluation instruments.

METHODS: The data was analyzed with SPSS 21.0 using Pearson's r and t-test for independent samples. Results of

Pearson's r test showed positive intercorrelations between all the resilience variables and between resilience and self-confidence.

RESULTS: The t-test showed statistically significant differences between male and female volleyball players in "forming relationships" and "self-efficacy" variables, with no other statistically significant differences observed for the rest of the resilience variables. Additionally, statistically significant differences were observed for "cognitive", "somatic" anxiety and "self-confidence" between the two genders of volleyball players.

CONCLUSION: It seems that male volleyball players are able to develop and use effective strategies not only in volleyball but in everyday life too, compared to female volleyball players, which are more concern about forming relationships comparing to male volleyball

players. Furthermore, data findings suggesting that male volleyball players can cope better with cognitive and somatic anxiety and perceived anxiety than female volleyball players as well as exhibit higher self-confidence in their abilities. Future research should

further investigate the relationship between resilience and self-confidence and how it affects the resilience level of volleyball players.

KEYWORDS: Volleyball, Gender Differences, Resilience, Anxiety

A22

EFFECT OF PHYSICAL ACTIVITY AND NUTRITION EDUCATION ON BODY MASS INDEX, BLOOD PRESSURE AND BIOCHEMICAL VARIABLES IN OVERWEIGHT AND OBESE ADOLESCENTS

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INTRODUCTION: The majority of obese children lives in developing countries. The ten-fold increase in obesity during the last four decades necessitates the implementation of interventions to mitigate the longterm effect of obesity into adulthood. The study aimed to determine the impact of physical activity and nutrition intervention on the body mass index (BMI), blood pressure and selected biochemical factors of overweight and obese children aged 13.0 to 16.1 years from eThekweni, South Africa.

METHODS: Participants (N = 41) with a BMI >85th percentile were included in the 10-week

controlled trial of physical activity and nutrition education intervention. Baseline and end measurements included BMI, blood pressure, and fasting biochemical variables (glucose, cholesterol, insulin resistance and alanine aminotransferase). BMI was classified according to the WHO BMI z-scores. The 10-week intervention entailed combined aerobic and resistance exercises supervised twice a week together with a once a week nutrition intervention. Participants performed additional unsupervised aerobic exercises three times a week.

RESULTS: Elevated systolic blood pressure (52%), low-density lipoprotein levels (29%), insulin (17%) and insulin resistance values (15%) were identified. The 10-week intervention programme significantly decreased BMI (30.8 ±

5.4 kg/m² to 29.8 ± 5.7 kg/m²; p < 0.01), systolic blood pressure (125.9 ± 15.7 mmHg to 115.2 ± 12.4 mmHg; p < 0.05), and low density lipoprotein cholesterol (2.63 mmol/L to 2.37 mmol/L; p < 0.05). Controlling for pre-testing variables as covariates, additional ANCOVA analysis highlighted significantly lower BMI (M = 28.33, F = 7.88, p < 0.05) and BMI z-scores (M = 2.08, F = 4.99, p < 0.05) in the intervention group post-testing.

CONCLUSION: A 10-week physical activity and nutrition education intervention in overweight and obese adolescents significantly reduced BMI and showed trends of a decrease in blood pressure and low-density lipoprotein cholesterol.

KEYWORDS: Blood Pressure, Cholesterol, Diet, Glucose, Lifestyle, Obesity

A23

HEALTHY EATING BEHAVIORS AND THE ROLE OF PARENTS AND FAMILY IN CHILDREN AGED 11, 13 AND 15 YEARS

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INTRODUCTION: All people acquire healthy or unhealthy habits during family life where the influence of the parental model is decisive. It is precisely the influence of parents at these ages that taken in the study 11,13 and 15 years based on the European study HBSC.

Methods. This study included children aged 11, 13 and 15 years old from Tirana (capital of Albania), of 5, 7, respectively 9 grade, both from the urban and rural environment. A total of 240 children's were included in the study, as follows: 120 children's from rural areas (40 children's 11 years old, 40 children's 13 years old, 40 children's 15 years old), and from urban areas the same number. The data collection was done using an anonymous tool based on the questionnaire used for the HBSC (Health Behavior in School-aged Children)

RESULTS: In the contemporary literature of dietetics it is a well-known fact that eating family together plays a decisive role in modeling healthy behaviors in children where the parent plays the main role. The recommendations show that it would be very valuable in many educational aspects for the family to consume most of the three meals, breakfast and dinner together. This lifestyle keeps the family together and children are educated with healthy eating behaviors. The data show that these ages in a large percentage do not consume breakfast (which is considered the most important meal) and this percentage increases with age.

DISCUSSION AND CONCLUSIONS: The study showed a prevalence of subjects from urban areas and a slight dominance of girls. Most children have daily dinners with their parents, where it is noticed that this percentage decreases with age. A more in-depth study at national level is needed to understand its causes. It is noticed that children consume in many cases an intermediate meal of the fast food type. These should be followed by specific interventions aimed at raising parents' awareness of their key role in influencing children and creating the basic premise for a healthy lifestyle in their ongoing lives as status changes from child to adult.

KEYWORDS: Healthy Behavior, Family Importance, Meal Consumption, Parental Role

PEDAGOGICAL SUPPORT OF THE INCLUSIVE EDUCATIONAL PROCESS BY USING DISTANCE EDUCATIONAL TECHNOLOGIES

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INTRODUCTION: Pedagogical support of an inclusive educational process is associated with the use of innovative approaches, on the basis of which distance technologies, methods and techniques of teaching are developed. Particular attention is paid to the use of interactive technologies in the educational process, which contribute to an increase in the effectiveness of physical culture activities aimed at improving the health of students with disabilities, allow the formation of constructive relationships between students with special educational needs and their healthy peers, and improve the process of professional and personal development of students. **METHODS:** Specific keywords “exercises”, “distance technologies”, “inclusion”, “inclusive educational process”, “e-learning” and relevant electronic databases such as PubMed, Web of Science and Scopus were used for the search. The study was conducted in accordance with the PRISMA recommendations.

RESULTS: The analysis of the obtained research results showed that all surveyed students with disabilities and disabilities (HHI) note the importance of accompanying an inclusive educational process using distance educational technologies, since they make it possible to engage in physical activity, regardless of location, to test all the proposed types physical activity and choose for yourself the best way for further studies, show yourself creatively when performing independent tasks. **CONCLUSION:** The results of the study showed that distance learning technologies contribute to the formation of positive motivation for the educational process among students with disabilities and disabilities, which has a positive effect on their learning outcomes.

KEYWORDS: Inclusive Educational Process, Distance Educational Technologies, Pedagogical Support, Interactive Technologies

HEALTH IN DIGITAL ENVIRONMENT: CHALLENGES AND SOLUTIONS

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INTRODUCTION: Office work is associated with movement restrictions, muscle stress, burnout and other risk factors that negatively affect the health of working - age people. The coronavirus epidemic has changed the labor market: neither

employers nor employees were prepared to tackle the challenges of moving to remote work. Therefore, search for solutions to preserve health of remote workers in the context of self-isolation and digital transformation is a priority medical and social task.

METHODS: Pilot research for examination of the office-workers state included interview, psychological, neurological tests and methods of instrumental visualization. The aim of the study was to identify the signs of the emotional impact of remote work and develop exercises to prevent physical inactivity, as well as technologies for monitoring of individuals' health.

RESULTS: The survey revealed that 80% of office workers have stress and burnout in an epidemic situation, as well as a loss of interest in work and professional achievements. Burnout was accompanied with increased irritability, sleep disorders. Neurological examination revealed muscle spasms and “tunnel” neurovascular disorders in the cervical spine and postural displacement in all persons. Electrophysiological research indicated cerebral acidosis and brain hypoxia in 50% of examined individuals. The programs for postural correction and cerebral metabolism included special coordination and breathing exercises. Recommendations to healthy lifestyle and working place reorganizing were given to all persons.

CONCLUSION: Digital transformation is a challenge that requires changes in legal, organizational, psychological and infrastructural approaches to preserve the remote workers health in the new environment.

KEYWORDS: Digital Transformation, Office Work, Health, Postural Stress, Coordination and Breathing Gymnastics, Remote Workers

MONITORING OF RUSSIAN PHYSICAL SCHOOL-AGE CHILDREN AND THEIR ATTITUDE TO PHYSICAL CULTURE

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This article analyzes the attitude to physical culture of school-age children. The data were obtained using the technology of monitoring physical activity of school-age children under the international program “Health behavior in school-age children” (HBSC). According to the results of the study, it was found that the characteristics of the attitude to physical education lessons differ depending on gender and age. In the fifth grade, about 70% of students have a positive attitude to physical education lessons. In the seventh grade, the number of respondents who have a positive attitude to the lessons is 25.4% for boys and 15.8% for girls. By the ninth grade, the number of positively related lessons is 24.5% for boys, 15.1% for girls. In the surveyed boys and girls from the fifth to the ninth grades, there is an increase in the indicators of a negative attitude to physical education lessons. So, among the students of the 5th grade, the number of boys with a negative attitude is 13.5%, and girls 22.5%. By the 9th grade, the number of boys with a negative attitude reaches 19.4%, and girls 26.7%.

KEYWORDS: Physical Activity, Monitoring, School-Age Children, Attitude To Physical Education

A27

SPORT AT THE SERVICE OF THE SOCIAL LINK. NEW SPACES. NEW PRACTICESJoel Gaillard¹¹ Université de Lorraine, Nancy, France

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INTRODUCTION: We cannot find a unique definition of the concept of handicap in Europe. Even within individual countries, many approaches are generally observed according to now this term is applied. Handicap is a generic concept which can comprise heterogeneous groups of people. Any international comparison reveals itself to be an arduous task. In fact the groups of people concerned are not the same everywhere and practices vary according to this specific cultural, social and economic backgrounds. Public policies depend on the different representations of the notion of handicap and are influenced by both disabled people themselves as well as by policy makers as well. For example in France from the early 1960s the word « 'handicap' » was progressively replaced by other nouns such as "infirme" (disabled) or "inadapté" (usted, malad).

The shift in meaning of the word "handicapé" seems to be related to the distressing ordeals experienced by some, which have led to somatic and mental weaknesses and to the idea that ways can be found to compensate for handicaps and allowing ways to live as a able-bodied person. Beyond the widely spread social norms and behaviour, the handicapped person faces constraining representations almost stereotypical which a lead to the sense of enclosure. Being born triggers or handicapped generates a whole set of psychic disorders provoking an inner and collective moral suffering. The human body can be considered as the prevailing pillar of identity for both handicapped and valid people. A two-fold psychological mechanism seems to be at the root of the handicapped person's self-acceptance and his/her relationships to others and to social groups. Through a mechanism of objectivation the subject rediscovers his/her own and full identity within the world of able-bodied persons. Through the mechanism of appropriation the handicapped person accepts his/her self-experienced own image as he experienced it. The construction of this new identity is internally nurtured and is strengthened by the close personal interactions which certainly contribute playing an important role in the development of our identity. The process is firstly generated among family members and then it is progressively encouraged more widely encouraged by social relations. In this perspective sport will fully impact the process. Beyond too widely and hurriedly accepted evidences it is highly recommend one should disregard preconception we might have, even those barred or so-called evidence and be prepared to change our area of focus to define the ideal approach. The main goal was to try to understand why and how sport activities can help to generate a transformation of self and social perception of our identity.

METHODS: The research was carried out using a qualitative method with practitioners gathered in dedicated spaces and in spaces used by practitioners. A quantitative method with a hundred of practitioners who answered a questionnaire completed by comprehensive interviews aiming at understanding the perception of the activity in a given context.

RESULTS: The report presents the results of a survey, which

was conducted in 2011 by the « Pôle Ressources National Sport et Handicaps » addressed to 1600 Clubs and 16000 Athletes indicate that a large number of clubs are really involved in the procedure of welcoming and confirms the positive impact of physical activity in order to reclaim a normal social image despite number of personal obstacles and considerable number of people with disabilities live in residential institutions.

CONCLUSION: The survey shows also that clubs adapt their structures and procedures to facilitate the inclusion of people with disabilities, rather than expecting them to change to fit in with existing arrangements.

KEYWORDS: Sport Territoires, New Spaces, Urban Places

A28

SPORT PRACTICES AND DISABILITY. TODAY CHALLENGESJoel Gaillard¹¹ Université de Lorraine, Nancy, France

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INTRODUCTION: Numerous elements contribute to strengthening the good life in the city. The strong development of sports practice in recent years contributes to this in several ways and now covers multiple issues: educational, cultural and social. The Economic and Social Council (CES) even speaks of a "social phenomenon". Indeed, the general interest is moving towards the emergence of new societal issues; it is now up to the government to fully consider the issues of the 21st century, which are public health and social cohesion.

The explosion of sports practices in the most diverse forms: collective practices (in groups, with family, friends...) or individual practices giving rise to more autonomous practices and a new relationship with the body. Sport is no longer just sport, it is a social fact which must be more than ever a factor of social link. The issue is no longer that of sportsmen and women alone, it concerns all the actors of social life in different ways and degrees: it is the object of a social contract. These free or self-organized sports practices correspond to a significant evolution in the perception of sports activity, which has moved from an objective of competition to functions of conviviality and health of life.

These new spaces have seen the explosion of sports activities practiced outside the traditional circuits of clubs or youth movements, by freely constituted groups of individuals or families. By deviating from the commonly accepted sports ethic, they participate in the construction of new social links, generating by the same token an entanglement of territories in which the group activity is organized. In fact, the public space, thus appropriated, spontaneously turns into a playful and recreational space that creates a very strong intergenerational link.

METHODS: The research was carried out using a quantitative method which was conducted in 2011, 2015, 2021 by the « Pôle Ressources National Sport et Handicaps » addressed to 1600 Clubs and 16000 Athletes. The questionnaire with about 50 types of questions: open, closed, matrices, scales which were then treated by Sphinx.

RESULTS: Urban spaces, these new places that human intervention has made suitable for sports use by "doing away with standardized places" (Lemoine, 2004), have been a first vector for the relocation of practices and the creation of

new relationships with the city. Practitioners must therefore appropriate the urban "territory" while paradoxically learning to share its use. The sport movement is thus led to make a real mutation in order to renew its approach to development by establishing itself in the new territories adding multidisciplinary to pluriactivity.

At the same time, access to sport for people with disabilities has become a reality but many difficulties remain. Even if the sport movement is particularly involved, this effort remains insufficient despite the fact that the practice of sport for the greatest number of people is one of the objectives shared by the institutional sport actors. Access to sports clubs is still too often impossible for many.

CONCLUSION: Sport is also an element that contributes to the attractiveness and influence of a territory, of a city. Beyond the sporting exploits and successes that highlight the dynamism of the city and its assets, sport in the city is also a public commitment that is reflected each year by the mobilization of many actors because sport by its links with other sectors of culture, cinema, arts, erases the differences in favour of the same membership, it expands the field of possibilities and creative imagination for all.

It is a question of questioning the territorial sports project, this collective construction to reinforce sports in the city today and tomorrow, for a better visibility of the sports offer, attentive to the constraints and needs of all.

A29

MULTIPARAMETRIC APPROACH TO INTEGRATED ASSESSMENT OF ATHLETIC PERFORMANCE

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INTRODUCTION: Obtaining an integrated assessment of performance in sports still remains a challenge for researchers. In general, the existing approaches can be grouped into several categories: single-parameter, multiparameter, qualitative, and combined. The monoparametric approach consists in isolating the main quantitatively measurable indicator (speed, strength, length, duration, scores) to be monitored, while the remaining parameters characterizing the functional status are eliminated. An expert assessment is carried out within the qualitative approach by coaches and specialists, evaluating whether an athlete is ready for competitions judging from the results obtained during training sessions. The combined approach includes individual elements from different assessment methods; however, it is difficult to interpret the dynamic indicators obtained correctly.

METHODS: Systematic approach, statistical method, survey, testing, comparison and analysis method.

RESULTS: The multiparametric approach seems to offer the greatest benefits as it is objective and informative, making it possible to track the variations in the status and performance of athletes over time and in comparison with each other. First, the most significant components affecting sports performance (genetic predisposition, health status, level of motivation, emotional state, general and special endurance, fitness level,

competition readiness) are isolated within the multiparametric approach. The intensities of these components are then translated into dimensionless normalized scores (stens), which have a normal statistical distribution and allow solving problems on population estimates of results. After that, the contributions of specific components to the final results are found for a given sport, with an integrated assessment obtained in accordance with the decision rules formulated. It is essential to normalize the indicators for the reference group of athletes with the best results, for example, a group of participants in national and international competitions.

CONCLUSION: The multiparametric approach can also be used in sports that do not have directly measurable performance indicators (games, martial arts, multisports competitions), which is its central benefit.

KEYWORDS: Multiparametric Approach, Integrated Assessment, Efficiency

KEYWORDS: Disability, Public Policies, Social Norms, Sport Clubs, Inclusion

A30

ADAPTING THE BUSINESS MODELS OF FOOTBALL CLUBS TO THE RULES OF FINANCIAL FAIR PLAY: CASE STUDY OF RUSSIA

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INTRODUCTION: This article discusses the main prerequisites, problems and recommendations for Russian football clubs related to the adoption by the UEFA of the concept of Financial Fair Play (FFP). These rules came into force in 2011, and most European teams have adapted to these requirements. On the contrary, clubs in the Russian Premier League are still at the stage of adaptation and often fall under sanctions from UEFA. That is why it is necessary to give recommendations to help Russian clubs coexist with the FFP.

METHODS: Specific KEYWORDS "Financial Fair Play", "UEFA", "football", "football club", "Russian football", and "Russian football club" were used to search relevant electronic databases, such as Scopus and Web of Science.

RESULTS: It was investigated the main problems hindering the adaptation of Russian clubs to the FFP rules and proposed changes in the business models of football clubs. In particular, the crucial requirement to diversify revenue sources in Russia is hampered by the low paying capacity of football fans. As a consequence, sports clubs depend too much on federal and state governments as the primary source of income. The article proposes different ways of diversifying the income of Russian football clubs, as well as changes to the way they interact with young players, the way they reward players and management, and other recommendations to improve club performance according FFP.

CONCLUSION: The findings suggest that Russian football clubs can successfully adapt their business models to the FFP rules if the recommendations would be implemented.

KEYWORDS: Football Club Business Model, Case Study, Russia, Financial Fair Play, FFP, Sports Management.

A31

GYM MACHINES FOR SIMULATING TRAINING OF TECHNICAL MOVEMENTS IN CURLING

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INTRODUCTION: Curling is a team sports game played on ice. The athletes slide stones one by one toward a marked target area. This is a sport in which the exactness of a throw is the base of technique and one of the main components of a successful play. In sport, technique means the way of making a physical action. Technical preparation is a process of education and improvement of movement skills, serving a mean of sports fighting. For making a throw of a curling stone an athlete has to push himself off a hack and slide in a deep lunge position holding a stone in his hand. In front of the hog line an athlete releases the stone. This report describes the machines for training the technique of throwing a curling stone.

METHODS: Using empirical research methods we have created and used the machines which were used during the training process at the special preparation stage of the preparation period. A special training roller ground for throwing curling stones was developed. The useful model RU 192760 patent was published on September 30, 2019.

The developed equipment allows to do imitative training of movements and technique of curling stones throwing. A training roller ground for a curling player's boot was designed. The useful model RU 193702 patent was published on November 11, 2019. The conditions for simulating training of exactness of take-off force in curling were created.

RESULTS: Using this equipment during the training process Krasnoyarsk athletes have become the winners of the city, regional, all-Russian competitions and prize-holders of the international curling tournaments.

CONCLUSION: For those sports where technique skills play an important role it is efficient to use machines simulating competitive actions.

KEYWORDS: Curling, Gym Machine, Technical Training, Patent, Training Roller Ground

A32

BASIC FUNCTIONS OF MANAGEMENT OF PHYSICAL EDUCATION OF STUDENTS

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INTRODUCTION: The system analysis of the content of the process of management of physical education of students makes it possible to clarify the classification of the functions of managerial activity in solving educational problems at a university. At the same time, three groups of management functions were used, which are most typical for all types of educational work with students: general; socio-psychological and technological.

METHODS: Information content and scientific and methodological support for the implementation of the experimental program was carried out on the basis of the Sports Club of the Institute of Physical Culture, Sports and Tourism of Peter the Great St. Petersburg Polytechnic University. The attitude of students to sports activity was determined and analyzed; scientifically substantiated and experimentally confirmed the main provisions of the organizational and pedagogical mechanism of management of physical education of students;

RESULTS: The results obtained in the course of the research showed that the general functions of managerial activity in solving educational problems at the university should include: the formation of goals, planning, organization and control. Socio-psychological functions are mainly related to the nature of service-professional relations in educational institutions and contain two types of functions: delegation and motivation. Technological functions distinguish two main types of management activities at any level of the hierarchy: decisions and communications. Thus, the general, socio-psychological and technological functions, mutually complementing each other, create an integral system of social and personal management of physical education of students at the university, which allows differentiating the methods and techniques of educational influence on them, specializing the management bodies and the work of their leaders.

CONCLUSION: The materials of our systematic analysis of advanced schemes of social and personal management of physical education of young people showed that the adoption of managerial decisions is one of the main tools for the development and implementation of an effective concept of management of educational influences.

In this case, the main requirements for management decisions are: target orientation; hierarchical subordination, validity, planning, targeting, security and directivity.

KEYWORDS: Functions, Social and Personal Management, Physical Education, Students

A33

KANOIST MOVEMENT PERFORMANCE ASSESSMENT BASED ON THE SPATIAL RECONSTRUCTION OF THE STROKE

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INTRODUCTION: The training process effectiveness is largely due to the use of tools and methods of integrated control that allows performing feedback between the coach and the athlete. In our opinion that allows to increase the level of management decisions in the training process. The basis of physical, functional and technical preparedness of rowers is formed during the off-season training with the use of specialized training devices. At the same time, the main task for the athlete is to transfer the technical skills, as well as the physical and functional conditions developed during the off-season training to the natural conditions of rowing.

An important role in this process is played by the control of the key aspects of the athlete's special training. Since the competitive result in rowing determines the time to overcome the distance, one of the main performance criteria is the performance of the athlete's movements. It can be assessed on the basis of spatial reconstruction of the stroke by kinematic and energy parameters that characterize the effectiveness of the athlete's interaction with the handle of the simulator or the paddle.

METHODS: The study involved highly qualified canoeists (n=6). Some of them are multiple winners and prize-winners of high-level international competitions. The program of the experiment consisted of test with different intensity on a rowing ergometer, as well as in natural conditions of rowing. The performance of the movements was evaluated based on the angular velocity of the ergometer handle and paddle using an inertial sensor with a built-in three-axis accelerometer, magnetometer and gyroscope. Data recording frequency of the sensor was up to 1000 Hz. The sensor is attached to the distal end of the ergometer handle, as well as in the grip area of the pulling hand on the paddle by means of a brace. For data analysis, an automated algorithm has been developed. That allows to identify individual cycles and key moments in each movement, as well as visualize the results.

RESULTS: As the results of the study, analytical tables were formed with data on the dynamics of indicators that characterize the performance of an athlete's movements in rowing locomotives when interacting with the ergometer handle and the paddle. The data of the dynamics of the angular velocity of movements are visualized, which allows us to clearly display the nature of the efforts developed by athletes.

CONCLUSION: The study results allowed us to identify individual characteristics that characterize the performance of athletes' movements, both on rowing ergometer and in natural rowing conditions.

KEYWORDS: Canoeing, Rowing Ergometer, Stroke Spatial Reconstruction, Inertial Sensor

A34

TECHICAL PREPARDNESS OF SKI RACERS MONITORING BY THE INDICATORS OF RECIPROCAL COORDINATION

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INTRODUCTION: The technique of ski movements is a complex structure of motor actions performed in both synchronous and contralateral modes. A non-optimal and non-coordinated system of movements from the point of view of biomechanics contributes to a significant decrease in the performance of athletes when passing a competitive distance. Even minor violations of the technique lead to

the displacement of limb constituent or the hole limb from the optimal trajectory. That provokes excessive tension and asymmetric work of the main muscle groups, significantly increases the energy intensity of movements, and also limits the propulsive efficiency of ski movements. Therefore, it is extremely important to monitor the technical preparedness of skiers in terms of reciprocal coordination in ski movements using small-sized measuring devices that allow recording the most informative and significant biomechanical parameters in conditions that are closest to natural ones.

METHODS: The study involved qualified athletes (n=3) with experience in high-level regional and international competitions. Athletes were asked to perform a test with a stepwise increasing load on a ski-roller treadmill. They were moving simultaneously with a double time ski technique (V2). The load was adjusted by increasing the angle of treadmill by 1 degree within each load stage. The duration of each stage was 4 minutes, between which the athlete was given a rest for 40 seconds. During the testing, the dynamic parameters of movements characterizing the interaction of the athlete with the ski equipment, bioelectric activity values of the main and largest muscle groups, as well as kinematic parameters characterizing the spatial movement of the athlete on the ski roller treadmill were recorded. Registration of the data was carried out using wireless programmable smart strain gauges instrumented in ski poles and roller skis. The complex of remote surface electromyography, as well as the motion capture system were used. Data processing was carried out at each stage (40 motor cycles were selected for analysis at each stage).

RESULTS: The analysis of skiers' reciprocal coordination should be carried out according to biomechanical and physiological parameters that objectively characterize the effectiveness of ski movements technique relative to the external and internal forms of movements. According to the results of the study, analytical tables were formed. During the data analysis various degrees of asymmetry of athletes' movements were established in terms of power and time parameters, as well as in terms of bioelectric activity of the muscles.

CONCLUSION: The results of the study allowed us to describe the individual characteristics of the special athletes' movements organization, as well as to identify motor disorders of the ski movements technique. Such information allows to objectively and accurately correct the training process by performing a set of auxiliary exercises in order to eliminate the established motor disorders.

KEYWORDS: Ski Movements, Double Time Ski Technique (V2), Reciprocal Coordination, Wireless Strain Gauges, Electromyography, Motion Capture

A35

KINEMATIC ANALYSIS OF "RUSSIAN" CIRCLES IN GYMNASTICS

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INTRODUCTION: "Russian" circle or Russian wendeswing is a gymnastic skill on pommel horse and in floor exercises. Effective performance of this skill gives a big value to the

gymnast's final competitive result. The kinematic analysis was arranged to determine the features of the Russian wendeswing technique performance in different types of supporting surface (the floor and on the pommel horse).

METHODS: The 3D Qualisys motion capture system was used to solve the tasks of research. 8 high-speed videocameras were used. Performance analysis was carried out in «Qualisys Track Manager» software. In the purpose of research the qualified gymnast performed 5 routines of three Russian circles on the floor (The FIG «C»-difficulty value) and same on pommel horse («D»-value).

RESULTS: The kinematic analysis of Russian circles performed on the floor and pommel horse showed difference in time and space parameters. The average performance time of Russian circle on the floor was 1.5 sec., when the same skill performance time on pommel horse was 1.68 sec. The phase structure of each circle contained 4 hand steps, 0.3-0.4 sec. duration of each. Russian circles performance control actions are performed by the arms effort with a change of the shoulder joint angle in the range of 4° to 35° in the floor circle performance. The pommel horse Russian circle performance showed the shoulder joint angle range of 9° to 40°. The gymnast's body position was quite similar in both skill variants that hip the joint angle range shows (140°-179°). The main difference between researched Russian circle based skills was found in position and shifting of hip joints and the sacrum attached marker. The floor Russian circle performance showed the vertical sacrum marker shift in range of 19 cm against of 11 cm in pommel horse performance. Together with the angular velocity (1.4 m/s versus 0.68 m/s) and angular acceleration (40.4 m/s² versus 27.2 m/s²) registered we found quite a big difference in these skills performance.

CONCLUSION: The research results show difference in kinematic parameters of the Russian circles performed on floor and pommel horse where the floor circles demands higher rotation speed from the athlete and presumes bigger vertical hips shifting. The pommel horse Russian circles performance got lower range of angular velocity and vertical hip shifting, but the shoulder joint angle found was bigger.

KEYWORDS: Russian Wendeswing, Circle Pommel Horse, Floor Exercise

A36

THE INFLUENCE OF INNOVATIVE GYMNASTIC EQUIPMENT ON THE OPINIONS OF PUPILS OF THE 2ND GRADE OF ELEMENTARY SCHOOLS ON THE SPORT ACTIVITIES AND EDUCATION OF GYMNASTICS

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The study presents the results of the research with focus on analysis and evaluation of the opinions of pupils of 5th and 6th grades of elementary schools. The research sample consisted of four groups of 800 respondents. The research took place in Banská Bystrica, home of the pilot project „Gymnastics – safely and attractively“. Banská Bystrica is the first city in Slovakia to buy innovative set of gymnastic equipment and tools for all elementary school in its municipality. We used the electronic questionnaire to find out the opinions of pupils on sports activities and on gymnastics teaching in elementary

schools. Based on the analysis of the individual answers we came to the following conclusions. All examined groups like the subject of physical and sports education as well as their teacher. They consider sport as a hobby or a lifestyle. There was a significant difference $p < 0.05$ in all questions. We found out the gymnastics is highly popular among the girls in the 5th grade placed as a second favorite, girls in 6th grade placed it on third place. The opposite is in the boys of 5th and 6th grade, where gymnastics is not a favorite activity for them. The pupils' interest in afterschool sport activities led by teachers in the monitored schools is low. More than half of all respondents like gymnastic lessons. The floor exercise is the most preferred among all respondents. More than 60% ($p < 0.05$) of respondents believe that they have sufficient material equipment at school for gymnastic lessons. Almost half of pupils noticed that their school had new gymnastic tools and equipment and used it in the education process.

KEYWORDS: Gymnastics, Innovative Gymnastic Equipment, Opinions, Physical and Sports Education, 5th Grade, 6th Grade

A37

THE IMPLEMENTATION OF THE TRAINING AT THE TIME OF THE EPIDEMIC AT A HUNGARIAN UNIVERSITY OF SPORTS SCIENCE

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INTRODUCTION: In the epidemic that shook the whole world, we suddenly had to adapt to the changed circumstances, also as educators. The content of the sports science courses had to be transferred to the online space, the theoretical and practical activities as well. We asked our students for their opinion on this topic.

METHODS: We worked with our own questionnaire, which includes the following groups of questions: demographic data, questions about the students' availability of tools, students' opinions about the requirements, communication with the instructor, the completion of the courses, changes in their own learning habits and their physical and practical preparation capabilities.

The members of sample was studied at the Eötvös Loránd University PPK in Szombathely and Budapest by students majoring in addition to other sport majoring BSc, physical education in undivided teacher education. The online questionnaire was sent out with the help of our education organizers, as a Neptune message, at a total of three times. 224 students completed our questionnaire.

RESULTS: No difficulties were reported by our students in the field of digital equipment, 90% had adequate tools. In contrast, their workload was much higher than in previous periods, which was reflected in a strong increase in time spent with studying ($p < 0.01$). The lessons, tasks and dissertations carried out in the online learning space were a bigger challenge for the lecturers, based on the opinion of our students, the education did not seem more exciting or creative (2.8 on a 6-point scale). Opinions about the educational platforms used were evenly distributed, they did not find it difficult to navigate between the different surfaces (3.66 on a scale of 6.)

CONCLUSION: An essential virtue of sports professionals is a high level of problem solving, which could be practiced in recent times. Both from student and educational perspective, we are past a difficult period, not yet completely. It is advisable to incorporate the experience of the recent period into the solutions of the important tasks ahead.

KEYWORDS: Student Opinion, Online Education, Sports Practice, Theory

A38

SCHOOL SOCIAL CLIMATE AND PERSONAL AND SOCIAL RESPONSIBILITY OF HIGH SCHOOL STUDENTS IN SECONDARY SCHOOL ACCORDING TO THEIR MOTIVATIONAL PROFILE

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INTRODUCTION: The aim of the present study was to analyze the motivational profile of high school students and how it was related to responsibility, basic psychological needs and school social climate, as well as to assess gender differences.

METHODS: For this purpose, a total sample of 302 students (M = 14.48; SD = 1.40) participated and were administered a multiple-choice questionnaire, where, in turn, gender and date of birth were asked.

RESULTS: A profile analysis was performed using Ward's method and k-means using the motivation scale (intrinsic motivation, identified, introjected and external regulation, amotivation) as variables for its elaboration. Two cluster profiles were finally created and named: a) "high motivation and low amotivation" (n = 212); b) "low motivation and high amotivation" (n = 95). Next, a multivariate analysis was performed, which showed that high motivation profile had statistically significant results at $p < .001$, higher in the satisfaction of the basic psychological needs of autonomy, competence and relatedness, personal and social responsibility and school social climate. On the other hand, attending to gender, no significant differences were found in the number of students in the profiles after analyzing the standardized residuals.

CONCLUSION: It is concluded that an increase in self-determined motivation can lead to an improvement in basic psychological needs, responsibility and school social climate, regardless of the student's gender.

A39

IS THERE A FUTURE FOR QUALITY ONLINE UNIVERSITY SPORTS?

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INTRODUCTION: Eotvos Lorand University's PE teachers responded to the Covid-19 in 2020 with online education. Despite some initial challenges, positive feedback from

students lead us to believe that online university sports have a future even on-campus education returns.

AIMS: Currently, university sports are taught online, which provides an opportunity to investigate the students' physical activity (PA) level and motivation to exercise.

The innovative sport course integrates the needs of students with the freedom of virtual teaching - students can exercise anytime, anywhere. Almost 400 students registered for the course, where 10 teachers update 13 types of physical activity weekly and monitor the students' progress.

MATERIAL AND METHODS: At the beginning of the spring semester 2021, 333 students (260 women) completed the ALPHA-FIT and Firstbeat PA questionnaires and the CPAS and EMI-2 motivation scales.

RESULTS: Before university, 54% of students practiced sports regularly, while 60% claim to currently have an active life style with active energetic and dynamic exercise 3-4 times a week. This is contradicted by the fact that in the last 3 months only 25% of students professed a high motivation for PA, while 45% felt some motivation and 30% felt no urge to move. According to the results a healthy lifestyle is the strongest motivation for PA, beside developing strength and endurance, and avoiding ill-health. Students in online education are motivated by competition and social recognition the least.

CONCLUSION: More students signed up to the online sport course than expected, and 90% of them chose the asynchronous format. Both students who regularly did sports in their youth and those who did not want to ensure regular PA in the epidemiological situation even virtually. Students who seek opportunities for regular PA for their own physical and mental well-being, rather than as a social activity, can benefit from virtual university sports. It will only be possible to receive an objective answer when contact classes restart and the number of students in the online course does not decrease significantly.

KEYWORDS: Online University Sport, Physical Activity Level, Motivation

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