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e-Book of Abstracts

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Programme Abstracts

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Foreword

The past two years have been difficult for all of us professionally and, for many of us, personally. Covid-19 has certainly shaped our work patterns as well as opportunities to meet face-to-face, share a coffee or (as they say in Scotland) a wee dram, discuss our research and projects, find areas in which we can collaborate, and develop networks and friendships.

It is for these reasons that INSHS was so pleased to be able to organise and manage a successful online 13th International Christmas Sport Scientific Conference in December 2021. The presentations were excellent, the range of topics was both contemporary and illuminating, and the Conference welcomed a fabulous mix of esteemed academic colleagues mixed with younger participants who are just beginning their research journeys.

This Book of Abstracts is testimony to the high levels of commitment and effort that all authors have shown to the disciplines in which we work, as well as to the dissemination of knowledge.

Everyone at INSHS wishes to thank you for your input, and we look forward to developing our futures collaboratively.

Dr. Ian Whyte

Professor Henriette Dancs

Professor Joel Gaillard

1st of December (Wednesday)

**ACADEMIC INTERNATIONALIZATION ON A SUSTAINABLE WAY -
CHALLENGES FOR THE FUTURE?**

Henriette Dancs

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Our challenging and unpredictable time in the pandemic have created new problems, challenges, but at the same time new opportunities and innovative solutions as well. Internationalization should be a clear and sustainable concept and strategy for decision makers, but also staff, researchers working in the HE scene. We can state that the phenomenon of internationalization has evolved from a marginal strategic activity to a key issue by now for universities. But the difference is very big, how much they realized really the significance of this trend. The presentation tries to give some answers to the following questions based on 40 year academic and international science management experiences. What do we mean by internationalization? What could be the sustainability aspects in internationalization? What are the key factors of internationalization? What innovative ideas, initiatives and policies are developed to enhance the internationalization of our specific field of sport and health sciences? What are the trends, and challenges in this field for the future in our critical time as a result of nationalist-populist political developments, climate change, environmental dangers and the pandemic?

BRAIN AND EXERCISE

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The first systematic examination of physical activity and brain relationship began in the 1970s, with findings indicating that older adults who regularly participated in physical activity had faster psychomotor speed, relative to their sedentary counterparts, on simple and choice reaction-time tests. Interestingly, no such relationship was observed in comparable groups of younger adults, suggesting that the benefits of physical activity on cognition were specific to older adults. Later, Sibley and Etnier's (2003) meta-analysis determined a positive relation between physical activity and cognitive performance in school-age children (aged 4–18 years) in eight measurement categories:

- perceptual skills,
- intelligence quotient,
- achievement,
- verbal tests,
- mathematic tests,
- memory,
- developmental level/academic readiness and
- other
- Exercise stimulates brain growth and boost cognitive performance.

This paper will discuss the above findings from historical and contemporary perspectives

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Benjamin A. Sibley and Jennifer L. Etnier: The Relationship Between Physical Activity and Cognition in Children: A Meta-Analysis. *Pediatric Exercise Science*, 2003, 15, 243-256.

USE OF SMARTPHONES IN PHYSICAL ACTIVITIES OF FEMALES AT GRAMMAR SCHOOLS AND SECONDARY VOCATIONAL SCHOOLS

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Introduction:

Lack of physical activity is a global problem of public health. Physical inactivity is the principle risk for obesity and other serious life-threatening diseases. This study is specialized in discovering the use of smartphones in physical activities of females from Slovak Republic and Czech Republic. Methods.

Methods:

The participants consisted of 1099 females who used smartphones and studied in 3rd and 4th year of high schools, conservatoires and grammar schools in Slovak Republic and Czech Republic. The main method was a survey that consisted of 13 questions which was distributed to Slovak schools from May 2019 to June 2020 (a paper-based survey). The survey distributed to Czech schools from September 2020 to November 2020 was an online survey through google forms. Paper based survey distributed to Slovak schools was evaluated through TAP3 software by a company based in Banská Bystrica, Slovakia. Online survey distributed to Czech schools was evaluated through MS excel. We analysed the results with the chi-square test at the level of $p < 0.01$, $p < 0.05$. For some of our needs we used arithmetic mean.

Results:

We discovered that 49.81% of females from Czech Republic spend 1-3 hours daily on their smartphones. In the Slovak Republic, 41.92% females spent the same number of hours on activities using their smartphones. Simultaneously, we discovered that females from Czech Republic (28.73%) and from Slovak Republic (29.48%) do 3 to 5 hours a day of activities connected with smartphones. Most of these females considered this time as adequate. The majority of activities in which they participated by using their smartphones were social media, chat, or e-mail (64.55%). The negative discovery was that only 3% of females used their smartphones in connection with physical activities. We found that 69.03% of females from Czech Republic and 67.14% females from Slovak Republic monitor the number of steps or distances walked/ran on their smartphones. We recorded a statistically significant difference at the level of significance $p < 0.01$ in questions no. 2, 6, 8 and at the significance level $p < 0.05$ in question no. 3.

Discussion and Conclusion:

From the point of view of what time they spend with activities related to smartphones, we discovered that most of the females were using their smartphones 1-3 hours daily, with some indicating 3-5 hours of daily activities. A total of 63.32% of females considered time spent with activities on smartphones to be adequate to this era. 22.24% of females realized that the number

of hours spent on their smartphones is high. Even though there are a lot of applications that can be helpful in doing physical activity, only a small percentage of our participants used them. Given that some applications work on a group system in which individuals can be added to groups in that application and the participants can motivate each other with their shared goals and results, encouragement should be given by schools for students to download and use such apps.

Key words: Adolescents, physical activity, smartphone, secondary schools

ASSOCIATIONS BETWEEN LOW ENERGY AVAILABILITY, EATING DISORDERS RISK AND BODY DISSATISFACTION IN ADOLESCENT FEMALE ATHLETES

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Introduction:

Previous research has suggested that athletes at risk of low energy availability can present with symptoms other than those traditionally expected and highlight the complexity of identifying individuals at risk. It is very important to recognize as early as possible the risk of low energy availability by evaluating the presence of symptoms which include menstrual and gastrointestinal dysfunction, injury history, as well as oral contraceptive use. This is especially so in aesthetic sports which require high levels of strength, power, and endurance as well as artistic skills to perform in different environments. Psychological factors such as stress, anxiety, and depression can result in or contribute to disordered eating behavior and low energy availability in athletes. This study aimed to verify possible links between low energy availability, eating disorders risks, and body dissatisfaction in aesthetic sports' adolescent athletes.

Methods:

Seventy-one female athletes (mean \pm SD, age: 17.55 \pm 3.15 years; height: 169.70 \pm 6.27 cm; weight: 58.75 \pm 6.42 kg; training 13.79 \pm 6.71 hours/week) completed questionnaires: Low Energy Availability Questionnaire (LEAF-Q), Eating Attitudes Test (EAT), and Body Dissatisfaction Scale (BSQ). Descriptive statistics and Pearson correlation coefficients were calculated with the use of software SPSS 20, with a significance level of $p \leq 0.05$.

Results:

Findings indicated mean scores of 4.41 \pm 3.29 for the LEAF, 9.03 \pm 8.54 for the EAT-26, and 64.66 \pm 31.56 for the BSQ questionnaires, suggesting that some of these athletes had scores indicative of the constellation of disturbances in eating patterns and potential risk factors. Results suggested that most of the examined female athletes fall into the normal range of BMI scores with regard to body mass and eating patterns, but there are athletes with very high scores on the questionnaires among them. No significant correlations were reported between low energy availability and other study variables, but EAT-26 and BSQ scores correlated significantly ($r=.694$, $p<.000$). Furthermore, BMI correlated with BSQ scores ($r=.447$, $p<.000$) and EAT-26 scores ($r=.265$, $p<.050$).

Discussion & Conclusion:

The study confirmed the relationship between body image concerns and pathological eating attitudes among female aesthetic sport athletes, but not with low energy availability. Research has suggested that in female athletes from aesthetic sports the prevalence of disordered eating

attitudes is higher than in female athletes from other sports, mainly due to sport-related factors like extreme training and practicing sports associated with high pressure and the idea that “being thin leads to success”. Earlier studies also concluded that the risk behavior for eating disorders is the factor most strongly related to body dissatisfaction among elite athletes. Education on investigated factors is necessary to encourage screening for and early identification of athletes at risk. Multidisciplinary healthcare professional input to ensure appropriate interpretation of the results of screening questionnaires and implementation of interventions is required. Because of the seriousness of the consequences of these disorders, early detection is essential in order to prevent the progression.

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Key words: females, aesthetic sports, body image concerns, female athlete triad

THE PLACE OF INTELLECTUAL GAMES ON THE PROBLEMS OF OLYMPISM IN THE EDUCATION SYSTEM IN VELIKIE LUKI

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Introduction:

Olympic education as a modern social phenomenon that is becoming increasingly popular due to the actualization of health problems, healthy lifestyle, and upbringing of the younger generation. In Olympic education, play activity has an important role in the formation and comprehensive development of a child's personality. Play activity allows him or her to actualize, concentrate and model certain types of behavior and activity, and assimilate social norms and values cultivated by modern society. In this regard, the dissemination of game projects, game programs, the identification of the socio-pedagogical potential of the game, and the justification of game models based on the organization and conduct of intellectual games is important at the present time. Olympic education in the city of Velikiye Luki is developing in several directions, including through intellectual games: 1. Young Olympians - for preschoolers; 2. Experts in Olympism - for schoolchildren; 3. The history of the Olympic Games - for students.

Aim:

The purpose of the research is to study the features of Olympic education in the city of Velikiye Luki with specific focus on the 'intellectual games': Young Olympians - for preschoolers; Experts in Olympism - for schoolchildren; The History of the Olympic Games - for students.

Methods:

Analysis of scientific and methodological literature will take place using analogical methods.

Results, Discussion & Conclusion:

1. The analysis of scientific publications devoted to the topic of Olympic education shows its importance in the education of young people and its role in promoting a healthy lifestyle. 2. In the system of vocational education there are all conditions for the promotion of physical culture and sports through intellectual games. 3. In Velikiye Luki, the Olympic education system has quite serious problems. For example, intellectual tournaments on the problems of Olympism are practically unrelated, have no consistency and continuity in the organization and conduct. Changes to these factors could increase their effectiveness.

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PHYSICAL EDUCATION TEACHERS` OPPINION ABOUT ONLINE PHYSICAL EDUCATION TEACHING: WHAT WE LEARNED AND HOW TO MOVE FORWARD?

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Introduction:

Covid 19 pandemic changes our everyday life and habits, affecting all aspects of our lives. The education systems were especially impacted. At the pick of the pandemic in 2020, nearly 1,6 billion learners in over 190 countries were affected (UNESCO, 2021) and schools and universities were forced to change the way that education was delivered. Online teaching and different distance – learning tools were implemented. Physical education was especially impacted as face-to-face contact, group interaction and team work were enabled. PE curricula were modified, shortened and adapted to distance learning. Different countries applied different approaches including online classes, livestreaming, recorded videos, utilization of different online platforms, movement apps, theoretical lectures focused on health component etc (Filiz & Konukman, 2020). In this period, the quality of PE teaching was highly depended on the enthusiasm and creativity of the teachers, their flexibility for teaching, IT skills. Support from school management, teachers' associations as well as guidelines from national educational authorities were identified as important factor for successful transition to distance learning and quality PE teaching during first wave of the pandemic (Korcz et al. 2021). Considering the essential role of the teachers for successful delivery of online teaching, the presented work is focused on investigation of teachers` opinions for perceived advantages and disadvantages of online PE teaching during the first wave of the COVID-19 pandemic, encountered difficulties and lessons learned for future practice. It was hypothesised that there would be differences in quality of online PE teaching based on level of schooling and working experience of the teachers.

Methods:

The research was conducted as a cross – sectional study, performed online in period between May and September 2020 on a sample of 133 PE specialist teachers in primary and secondary schools from North Macedonia, (99 primary PE teachers, 34 secondary PE teachers), at age from 25 to 65 (M=45.9; SD=30.44) and average working experience 13y (SD=8.4) The study was conducted using electronic questioner, designed by Team of Department of Didactics of Physical Activity at Poznan University from Poland and applied for the purposes of larger international study for online PE teaching (Korcz et al, 2021). It was composed from twenty-four questions aimed to identify teachers' opinions for the quality of online PE teaching, main advantages, disadvantages, perceived difficulties and concerns they encounter, as well as their attitude, motivation, and IT skills for online PE teaching. Data were analysed using basic

descriptive statistic parameters. T-test for independent samples and F-test (ANOVA) were used to determine differences between PE teacher based on level of schooling of PE teachers and years of their working experience.

Results:

According to the study results, the main advantages of online PE teaching were allocated in possibility of using modern technology in practice; presenting personal competences to students; greater students independence and individual approach toward students learning. From the side of disadvantages, the following were identified as being important: difficult implementation of the core curriculum content; inability to verify the implementation of movement tasks in a proper way; inability to monitor student progress in a satisfactory way. Teachers faced many difficulties during online teaching. Following were determined as biggest obstacle: lack of proper training for use of technology; lack of proper equipment at home (laptop, tablet, speakers, headphones, microphone) and lack of experience with applications and platforms for online learning. PE teachers differ regarding level of schooling in several aspects. Teachers improve their IT skills during online teaching using different IT tools and mobile apps for monitoring and evaluation. Statistically significant differences regarding level of schooling and years of working experience, were determined in several items. Particularly, secondary school teachers evaluate higher students' independence as advantage of online teaching ($t=-1.946$; $df=128$, $p=.054$), access their personal IT skills higher than primary PE teachers ($t=-1.946$; $df=128$, $p=.054$) and encounter decrease of self – satisfaction from their work in conditions of online teaching ($t=- 2.425$, $df=131$, $p=.017$), followed with reduced level of motivation for work due to pandemic. Regarding years of working experience, statically significant differences were obtained with respect to general evaluations of online PE teaching, biggest disadvantages of online PE and perceived goals during online teaching and sources of motivation. Particularly, novice teachers evaluated PE teaching process as average compared to more experienced teachers that choose poor ($F=4.931$; $df=132$, $p=0.009$); their main concern is unauthorized use of personal pictures and video, while for novices and those who are less experienced, the safety of children was reported as the biggest concern ($F=3.734$, $df. 132$, $p=.026$),

Discussion & Conclusion:

Results from the study identify the most important areas of teachers work where PE should be supported regarding online teaching but also emphasise the area of improvement. In this regard, due to implementation of online teaching, PE teacher become more open and prepared to use different IT tools and online learning resources, as well as become more experienced in technology utilization. Different platforms such as zoom, YouTube videos, Skype, Eduino; Microsoft Teams were applied and provide teachers possibility for online, real time contact. This resulted with “average” and “well” level on self – reported evaluation, confirmed their improvement in this segment. Safety of students during online classes, personal skills for use of application and unauthorized use of teacher's photos and videos for purposes that are not for teaching, were identified as being the biggest concerns of teachers during online PE teaching and required additional efforts and legislatives. Awareness for their existence, discussion with children for the intellectual property and behavior during online teaching should be considered

in future. From the aspect of involvement of students and the level of their activity, a decrease of PA level was reported. It is due to greater focus on theoretical, health-oriented lessons, compared to performance oriented, lack of available spaces and resources, modified and reduced PE curriculum etc. Similar situations are noted in many countries around Europe (Korcz et al, 2021). Strong and weak points of online teaching were determined and discussed. Based on them, recommendations are prepared and presented in front of PE teachers. Strong and weak points of online teaching were determined and discussed. Based on them, recommendations are prepared for PE teachers aimed to improve the quality of PE.

Keywords: Physical education, online meeting, advantages, disadvantages

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WAS PHYSICAL EDUCATION AS BAD AS PEOPLE REMEMBER IT?

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Observations of middle aged to retired clients in Personal Training practices in London UK, surfaced two themes; exercise-averse individuals with sedentary leisure and work pursuits reported poor experiences of physical education in secondary (high) school, whereas more active clients reported positive reflections. This instigated a systematic examination of contemporaneous documents and literature, which sought to explain the context of this reality. Five major themes emerged: The politico-educational environment from the 1960's to the 1970's, the parallel experience of maths anxiety, teaching practice, navigating failure, and economic implications. Evidence suggests why the behaviour of a generation has been impacted; a post-war hierarchical social order undergoing profound change, poor pedagogic practices in which the less able found themselves suffering everything from corporal punishment to physical embarrassment, and response models to failure predict clients' later behaviours. The research findings substantiate the claims of clients' memories of negative experiences with physical education at secondary school. The research concludes that the socio-economic costs associated with such past failures in PE are estimated to exceed £6 billion over the life of a contemporary five-year UK government and have clear social and economic implications for other developed democracies.

Keywords: Schools, Physical Education, Middle-age, Sedentary, Failure, Anxiety

GLOBAL POSITIONING SYSTEMS: MORE THAN JUST A LOAD MONITORING TOOL

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The quantification of external load through global positioning systems (GPS) is now commonplace across team sports. Training load reports are generated following each training session and have become a key element in programming both team and individual training sessions. These reports guide coaches and sport scientists to both improve performance and importantly decrease injury risk. However, GPS technology has the potential to be a tool that can be used in a wide range of applications that will not only improve performance of players but also contribute to decision making regarding tactical strategies. But it is important that practitioners can separate the 'signal' from the 'noise' to make evidence-based decisions. The validity and reliability of not only the hardware but also the metrics used during data collection is something practitioners should consider before making inferences about their findings. Some of the most frequent metrics used are distance covered in different speed zones, accelerations and accelerometer metrics such as PlayerLoad. During training these metrics can be obtained live and used to manipulate training drills to better reflect training outcomes or specific match scenarios. One such drill is small sided games (SSG) where studies have used GPS technology to manipulate intensity as well as investigate how centroids, width, length and surface area change with different SSG manipulations by using raw longitude and latitude data. Another application for GPS technology is using it for fatigue analysis during matches. Several studies have described the variations in intensity during official match-play and tournaments, highlighting the presence of both transient and accumulated fatigue across time points. Some of these studies also investigated the possibility of team sports participants using pacing strategies during match-play. A crucial component to maintaining intensity during match-play is the use of substitutions. GPS technology was used in numerous situations to dictate tactics by analysing different substitution strategies as well as different re-warm up approaches to ensure that when substitutes do enter the field of play they are contributing towards an increase in intensity. Finally due to the high number of metrics available with GPS technology, it is important to consider which metrics are presented to coaches and players as well as the way in which it is presented to get the buy-in from all role players.

ROLE OF SMARTPHONES IN INCREASING PHYSICAL ACTIVITY IN SECONDARY SCHOOL STUDENTS

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Introduction:

In today's world, physical activity is gaining more importance, not only in academic community, but also with the general public. Nowadays, many students expect to see involvement of new technologies in school such as smartphones, tablets, and computers. The level of physical activity is very easily affected by various external influences such as smartphone apps, which may be ideal in increasing physical activity. Smartphone apps are considered motivational tools in increasing physical activity. The aim of the study was to analyse the role of smartphones in increasing physical activity in secondary school students.

Methods:

The study group was chosen purposively to meet the aim of the study. The following criteria applied: a) participants should not have health issues; b) participants should be from the same year of students. The group consisted of 113 secondary school students [(Male control group n=30 (26.54 %); Male experimental group n=25 (22.12 %); Female control group n=30 (26.54 %); Female experimental group n=28 (24.80 %)]. The current level of physical activity was detected by using the smartphone app - Samsung Health [(Samsung Electronics Co., Ltd.; Suwon, the Republic of Korea; Android 5.17.1.003; iOS 1.5)]. Two 14-day challenges were created to increase physical activity in the participants. To determine the statistical significance of 2 control groups (n = 60, 53.08 %) and 2 experimental groups (n = 53; 46.92 %) we applied the Wilcoxon Signed-rank Test ($W_{\text{test}} p < 0.01, p < 0.05$). To verify 4 independent study groups, we applied the Mann-Whitney U-test ($M_{\text{wtest}} p < 0.01, p < 0.05$). The material and practical significance was evaluated by using the effect size coefficient (r) (r = 0.10 - small, r = 0.30 - medium, r = 0.50 - large effect size).

Results:

The first 14-day challenge resulted in improvements in both control and experimental groups of secondary school students ($p < 0.01$). After 28-day challenge, we recorded the improvements in the female experimental group ($p < 0.01$), male control and experimental groups ($p < 0.01$) and female control group ($p < 0.05$). When comparing the independent study groups, we recorded improvements, which were significant at 1.00 % and 5.00% level.

Discussion & Conclusion:

Secondary school students are increasingly using smartphone apps routinely in more areas of their personal lives. Smartphone apps aimed at increasing physical activity are effective in

helping secondary school students to achieve the required physical activity level. Our study provides evidence that the technique of challenges used in the smartphone app - Samsung Health significantly ($p < 0.01$, $p < 0.05$) increase the physical activity level of the secondary school students. According to our results, we recommend using the smartphone app - Samsung Health as a motivational tool in increasing the physical activity in secondary school students.

Key words: Challenge, physical activity, secondary school students, smartphones.

STUDENT SPORTS OF THE RUSSIAN FEDERATION - GOALS, OBJECTIVES & DEVELOPMENT PROSPECTS

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Introduction:

Student sports are an integral part of sports cultivated in higher educational institutions, integrating mass sports and sports of higher achievements.

Aim:

The research purpose was to analyze the current state of development of student sports in the Russian Federation.

Methods:

This will be a desk-based study, analysing scientific and methodological literature and governing documents of the Russian Federation regulating the activities of student sports.

Results:

Student sports in the Russian Federation have their own rich history since their inception. The origin of student sports and their further development began with the creation of two major student sports organizations in our country, the RSSU and the SSCA. The Russian Student Sports Union is an all-Russian public organization. Its main activity objective is to assist the state in implementing the youth policy strategy through the effective organization of the student sports system in the Russian Federation and the development of international cooperation in this area. The «Student's Sports Clubs Association of the Russian Federation» (SSCA) task is to develop student sports by popularizing it among the student masses through a system of competitions of various levels. To promote student sports activities and the ideals of RSSU and SSCA there was created a Student Sports Club at Velikie Luki Sports Academy. This club is now an integral part of SSCA. The club creates a comfortable sports and educational environment for the successful acquisition of knowledge, skills, and abilities in the field of physical culture and sports.

Discussion & Conclusion:

Development of student sports in Russia is ensured through the effective activities of state, public, and entrepreneurial organizational and management structures involved in the promotion of sports ideals among students. The development of physical culture and sports in the system of higher professional education requires close attention not only from the federal executive authorities in the field of education and sports, but also from the heads of higher educational institutions. This might dictate what kind of special support that our country will receive, to lead students to be able to solve important professional tasks, further develop competencies acquired by them while learning, as well as lead to healthy lifestyles.

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HISTORICAL JOURNEY THROUGH RESEARCH METHODS IN SPORT AND PHYSICAL EDUCATION

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Introduction:

Methodology of the scientific research in sport and physical education has the aim to advance the knowledge and understanding of human movement and exercise and to improve their application in different types of activities with different kind of populations (athletes, children and youths, elderly etc.). The aim of this paper is to review the historical aspects of the methodology of scientific research in sport and physical education, to find the roots of sports science and to identify the milestones in the development of research in sport. As this was the case with other similar scientific disciplines crucial to the development of sport and physical education as a new scientific field was the foundation of professional associations and the establishment of scientific journals in which current research could be published. Nowadays there are dozens of serial scientific publications in the field of sport science. Those are the journals that are very respectable compared to other scientific fields, and which for many years recorded an increase in the impact factor on international scientific lists (Journals of ISI publications). One of the first scientific journals in the field of sports science was launched in the USA in 1896 and was titled American Physical Education Review. The researches published in the first sports science publications borrowed the methodology from other, already established, scientific disciplines (natural sciences, medicine, humanities) with the tendency to develop their own and original scientific approach, today known as methodology of sport science research.

Methods:

This research is conducted as literature review. In studying the historical aspects of methodology of scientific research in sport and physical education we applied historical and descriptive methods. Historical method consists of four phases (collection of knowledge sources heuristics, analysis and criticism of sources - the criticism of the text; synthesis generalization and linking the sources; exposure - presenting of results). Sources and literature in the field of sport and physical education were collected at the beginning of the study, and then the analysis of the oldest articles published in scientific journals and their methodological characteristics were performed and subsequently presented. The descriptive method involves describing the most important features of the sport science research. It is used to represent the data collected by previously described historical method. Articles and scientific publications were identified through multiple formal search methods including hand searching of key journals and textbooks relevant to the research methods in sport and physical education, electronic searching of main databases and searching the references within relevant articles. Electronic searches of the following databases were conducted: Web of Knowledge, Web of Science, SPORTDiscus, Google Scholar, PubMed. The presentation of historical aspects of

methodology of scientific research was performed using quantitative and qualitative analysis of an ample body of scientific papers, textbooks and monographs published in English language.

Results:

The roots of the research methods in sport and physical education date back to the second half of the 19th century and the first published articles about the anthropometric characteristics and motor abilities (strength, endurance, speed, flexibility etc.) of children, students and athletes of different age, and sports. The predecessors of the sports scientist were the physical education teachers who applied first measurements with the school children and students. The first scientific publications in the field of sport science based on the previously mentioned measurements were published in *American Physical Education Review*. Many physical education teachers who published scientific articles in this journal, especially those who were the leading representatives of this new scientific discipline, possessed the formal education in the field of medicine. For these reasons, the focus of their scientific research was on biomedical research. However, at seminars and conferences of newly established associations a greater diversity of articles could be observed, each in its own way, treating sport and physical education. There were articles that had quite good methodological quality and had a real scientific approach to the study of physical abilities and responses of the body due to physical exercise, but also very practical work that had great importance for educational practice of physical education teachers, but not for the science of sport and physical education.

Conclusion:

Until now sports science evolved to the level of the very respectful scientific field based on sound scientific methodology. Sports scientists today use very sophisticated, valid and reliable scientific instruments for measuring human abilities and skills with the final aim to improve sports practice and application of physical activities.

Key words: sports science, history, research, methodology

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Spanish language session

LA INTELIGENCIA ARTIFICIAL Y LAS CIENCIAS DEL DEPORTE (ARTIFICIAL INTELLIGENCE AND SPORTS SCIENCE: NEW PERSPECTIVES)

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Universidad de Alicante (Spain)

La inteligencia artificial está entrando en el mundo del deporte. Un ejemplo de ello, es el sector del alto rendimiento deportivo, muchos deportes como el fútbol, el baloncesto y béisbol han empezado a aplicar sistemas de mejora, para obtener una ventaja competitiva que antes no tenían. La inteligencia artificial en el deporte es una realidad que está impactando de forma significativa en muchos de sus aspectos.

Los distintos ámbitos de aplicación en materia deportiva van, desde la mejora de variables técnicas, tácticas y físicas. A través, de sus múltiples aplicaciones enfocadas a mejorar, entre otras cosas, el rendimiento de deportistas y técnicos.

La prevención de lesiones es otro campo, que la IA ha considerado como importante para su desarrollo y ha empezado a aplicar este tipo de sistemas para la mejora de la salud de los jugadores profesionales de los distintos deportes.

La gestión deportiva, también se ha abierto a la IA, mediante un nuevo campo para que los profesionales con un perfil de asesoramiento y predicción de acontecimientos, puedan apoyar al sector desde la inteligencia artificial.

Junto a lo anterior, no podemos olvidar que en todos los procesos de enseñanza-aprendizaje se puede influir de la IA, por ello, apostamos por la introducción en el deporte inicial y en las clases de educación física.

EXERCISE FOR THE HEALTH AND QUALITY OF LIFE OF PEOPLE LIVING WITH AIDS

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Introduction:

The acquired immunodeficiency syndrome (AIDS) was first identified in 1981, becoming a milestone in human history. The epidemic of human immunodeficiency virus (HIV) infection represents a global phenomenon that can manifest itself in different ways depending on individual and collective behavior. Although there is currently no cure for AIDS, there are treatments capable of slowing its progress, aligned with a healthy lifestyle, which includes the practice of physical exercise, capable of promoting morphological, metabolic and functional changes that are directly linked to reduction of symptoms and minimization of complications caused by the disease, enabling an improvement in health in life expectancy.

Objective:

To present the impact of physical exercise programs on the health and quality of life of people living with AIDS (PVA).

Development:

The harm that HIV causes to the human body are basically fought by antiretroviral therapy (ART), which has significantly increased the life expectancy of people living with AIDS. However, non-pharmacological strategies are important adjuvants in improving the immune profile, normalizing inflammatory responses and combating cachexia and other morphological disorders. Physical exercise, especially performed against resistance, stands out in this context. It is recommended for patients with cachexia, training aimed at muscle hypertrophy, with series alternating by segments, performed with 70 to 90% of maximum strength, with 6 to 12 repetitions, performed at the 6020 rhythm (Polyquin), with 3 to 5 minutes break between sets.

Conclusion:

Strength training programs performed with PVA for three months were able to maintain viral load, normalize interleukins, increase lean mass, improve self-perception of health and improve the quality of life of these patients.

Key Words:

HIV; Acquired Immunodeficiency Syndrome; Exercise; Indicators of Quality of Life; Health Impact Assessment.

UN MODELO PEDAGÓGICO DE EDUCACIÓN OLÍMPICA EN CENTROAMÉRICA

Amapola Arimany

Guatemalan Olympic Committee (COG) and the Guatemalan National Sports Confederation (CDAG)

En las zonas marginales de las ciudades del norte de Centroamérica, hay muy poca cohesión social y supervisión adulta, baja calidad de vida y presencia de hogares disfuncionales. Los niños, niñas y jóvenes de estos barrios son vulnerables y susceptibles de ser parte de los grupos criminales que generan violencia e inestabilidad. Tienen mucho tiempo libre para supervisar y salir a las calles, a menudo cayendo en la tentación de formar parte de las pandillas para obtener ganancias y darles un sentido de pertenencia. Por otro lado, el tema de la educación física en estos lugares, que es importante para el desarrollo integral del niño, niña y adolescente, cuya entrega es deficiente por diferentes motivos; no llega a todos los escolares de manera adecuada. El deporte estructurado y debidamente guiado es una herramienta importante para llevar a cabo los valores éticos y morales de los jóvenes. Una vez que participan en actividades divertidas y saludables, les da un sentido de pertenencia y, en general, mejora su desarrollo físico y psicosocial. También brinda la oportunidad a las federaciones deportivas de capturar talentos. El modelo educativo de Educación Olímpica de Hoodlinks acerca el deporte a niños y jóvenes de zonas marginales, barrios de alto riesgo o asentamientos, con el aporte de patrocinadores, autoridades deportivas y / o entidades gubernamentales. Incluye deportes de federaciones proactivas y que se adapten a la constitución física y cualidades de los participantes en el área, o sea, deportes en los que pueden sobresalir. El modelo pedagógico promueve la integración social y educativa en los barrios donde viven jóvenes en riesgo, considerando la importancia de entregar valores al grupo objetivo, a través de la aplicación de la Educación Olímpica. Las federaciones brindan apoyo técnico deportivo y parte del equipo para ayudar a los niños en la práctica de su deporte en el barrio todos los días de la semana y en un parque deportivo o en las respectivas federaciones, eventualmente. El proyecto Hoodlinks contrata entrenadores seleccionados especializados para cada deporte y los capacita para el uso del modelo. Las prácticas se realizan durante horas extraescolares (antes o después de clases) en lugares cercanos a sus hogares, adaptándose a las condiciones existentes, espacios libres en parques, salas comunitarias, canchas o grandes locales en escuelas o parques, etc. durante varias horas al día. Se practica de lunes a viernes y, a veces, los sábados en caso de que haya competencias. El entrenador es clave para el éxito del proyecto. El manual de entrenadores genera la guía técnica deportiva, incluyendo los valores a aplicar en sus planes diarios, mensuales, semestrales. Este incluye formatos para sus informes semanales y mensuales, asistencia, aplicación de valores y más.

El proyecto se ha aplicado en tres países, Guatemala, Honduras Belice y pronto comenzará en Costa Rica. El modelo de educación olímpica se adapta a las condiciones de cada contexto. Se pretende que sea una práctica sustentable e inclusiva de diferentes "stakeholders". Esto puede ser una empresa privada, una fundación o entidad sin fines de lucro que administre los fondos de manera transparente, entidades del gobierno central, municipio, comunidad (líderes comunitarios, vecinos, padres) y federaciones deportivas nacionales o CON.

Algunos de los deportes que se practican son bádminton, judo, golf, boxeo, atletismo, taekwondo y gimnasia en Guatemala; atletismo, balonmano, taekwondo, tenis de mesa y halterofilia en Honduras y baloncesto, voleibol, fútbol, atletismo, softbol, judo y boxeo en Belice, pero este último país se vio afectado por el COVID 19 y detuvo el proyecto. Antes de la pandemia se tenía en Guatemala 800 niños, en Honduras 1,300 y en Belice 300. En la actualidad ha bajado ese número.

THE EFFECTS OF ACUPUNCTURE IN ENHANCING SPORTS PERFORMANCE

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Introduction:

The level of resting serum lactate is a potential predictor of muscle exertion during training or competition (Facey, A., Dilworth, L., & Irving, 2014). 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 (Brooks, 2009). A series of actions were suggested to accelerate blood lactate clearance, such as active rest, consisting of low-intensity cyclic physical activity (Messonnier et al., 2001) and cold water immersion (MacRae, Dennis, Bosch, & Noakes, 1992). This is because faster removal may be a physiological and athletic advantage, given that metabolically, lactate may decrease an athlete's physical performance, particularly when they compete in more than one event over a short period of time (Tomlin & Wenger, 2001). Acupuncture, an oriental technique with proven benefits for human health (Kamali, Sinaei, & Morovati, 2018), involves needle insertion into specific sites of the body to stimulate them and release so-called chakra energy. According to traditional oriental medicine, vital energy retained at these points may be the cause of disorders (Lima, 2015). Studies have demonstrated the positive effects of acupuncture on athletic performance.

Objective:

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.

Methods and Results:

Seven competitive male engaged in HIIT. The characteristic was 31.61 ± 7.02 years old, heart rate reserve 59.71 ± 4.10 , lactate 3.31 ± 0.63 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: P2 15.00 ± 1.18 - P3 19.59 ± 1.46 $p = 0.0004$; Heart rate: P2 163.71 ± 7.27 - P3 177.60 ± 6.99 $p = 0.0007$; Blood pressure: P2 174.86 ± 1.57 - P3 180.86 ± 1.77 $p = 0.0001$.

Conclusion:

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.

Key words: Acupuncture, lactate, heart rate, athletic performance

REALIDAD AUMENTADA APLICADA A LA ENSEÑANZA DEL JUDO

Mauro Cesar Gurgel de Alencar Carvalho

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Introduction:

This lecture aims to present the creation and development processes of an Augmented Book (AB) to teach Judo. As such, it addresses various themes like the understanding of the origin of teaching materials and the state of the art of Augmented Reality (AR). Other aspects such as the existing limitations in printed and digital books to an AB; the importance of creating an AB during the present pandemic moment; the definition of AR; the necessary technologies; the systems of AR and its applications; phases of the creation of the AB, and; the methodological assumptions and our research are also presented.

Conclusion: the creation and development of an AB to teach Judo represents a valid and reliable process and produces effective learning for children and adolescents.

Resumen:

El objetivo de esta ponencia es presentar el proceso de creación y desarrollo de un Libro de Realidad Aumentada para la enseñanza del Judo. Para tal, aborda diferentes temas para la comprensión de la origen de los materiales didácticos y el estado de la arte de la Realidad Aumentada. Así como serán presentados: las limitaciones existentes en el libro impreso, el libro digital en relación al Libro Aumentado; la importancia de crear un Libro Aumentado durante el momento actual; la definición de Realidad Aumentada; las tecnologías necesarias; los sistemas de Realidad Aumentada y sus aplicaciones; las fases de la creación del Libro Aumentado; los presupuestos metodológicos y nuestros trabajos y resultados para la enseñanza del Judo.

Conclusión

La creación y desarrollo de un Libro Aumentado para la enseñanza del Judo es un proceso válido, confiable, produce aprendizaje efectiva en niños y adolescentes.

ANÁLISIS BIOMECANICO Y ELECTROMIOGRAFICO EN CICLISTAS DE ALTO RENDIMIENTO

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Resumen.

El análisis del reclutamiento de las unidades motoras de los músculos de las extremidades inferiores en ciclistas de alto rendimiento durante el pedaleo es necesario para implementar las intervenciones. Este trabajo examina la electromiografía de superficie (EMG) de la actividad muscular de las extremidades inferiores de ciclistas de la liga de Bogotá (BL).

Metodología.

Después de la aprobación del comité de ética, se seleccionaron 13 ciclistas de alto rendimiento de la BL y se les realizó una prueba incremental (IT) en un cicloergómetro (comenzando en 100 W y concluyendo en 250 W, con incrementos de 50 W cada 3 min pedaleando a 90 Hz). Se realizó EMG en el miembro dominante del grupo de músculos cuádriceps (Q), Isquiotibial (IT) y Triceps Surae (TS).

Análisis de resultados.

Se preprocesaron series temporales de EMG para eliminar la tendencia de la señal (DC). A continuación, se aplicó un filtro de paso de banda Butterworth de octavo orden (corte = 70 y 250 Hz) a través de la banda de frecuencia de fibras de contracción rápida (FTF) y fibras de contracción lenta (STF). Luego, se obtuvo la densidad espectral de potencia (PSD) mediante Transformación Rápida de Fourier, posteriormente se calculó la energía en la banda de baja frecuencia (LFB) relacionada con las frecuencias entre 70-125 Hz y la banda de alta frecuencia (HFB) con frecuencias entre 126-250Hz, por cada período de 3 minutos. El PSD mostró un aumento de la energía en todas las épocas y una fase sincronizada entre el grupo de músculos IT y Q, mientras que el TS tuvo un retraso de 0,2 s en relación con otros grupos de músculos. Con respecto a la media de energía del LFB, se observó un aumento en todos los grupos musculares principalmente de IT (Q = 0,80 a 4,86 unidades arbitrarias (au), IT = 2,21 a 5,25 au, TS = 2,41 a 2,66 au), mientras que en las frecuencias altas ocurrieron una disminución en el TS (Q = 0.42 a 2.41 au, IT = 1.39 a 3.76 au, 3.97 a 2.10 au).

Palabras Claves: Electromiografía, Ciclistas de alto rendimiento, Fibras de contracción Rápida y Lenta

NUTRICIÓN DEPORTIVA Y SUSTENTABILIDADE

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Introducción:

La nutrición humana es uno de los determinantes de mayor impacto sobre el medio ambiente y por ello se han creado estrategias para asegurar su sostenibilidad. Si bien la sostenibilidad alimentaria debe ser una preocupación general para la población, las estrategias alimentarias sostenibles deben abarcar a todos los grupos de personas, incluidos los deportistas. La prioridad en la selección de alimentos para deportistas está íntimamente relacionada con el objetivo de incrementar el rendimiento deportivo, sin preocupación por el impacto ambiental. Entre los deportistas, es común encontrar personas que hacen dieta con un consumo excesivo de proteínas, especialmente de fuentes de proteína animal que se sabe que tienen un impacto ambiental significativo.

Métodos:

Esta investigación es el resultado de una búsqueda bibliográfica sobre nutrición deportiva y sustentabilidad. Se seleccionaron bases de datos como Pubmed/Medline, Cochrane, Lilacs/SciELO, en inglés, portugués y español, en los últimos 5 años, con estudios clínicos controlados.

Resultados:

Hubo 56 estudios y estudios, solo 28 de ellos tenían contenido relevante que aborda la alimentación sostenible, utilizados para este estudio. En este sentido, las plantas alimenticias no convencionales (PANC) se integran perfectamente en el contexto de un ambiente biodiverso, nutritivo y equilibrado, que es parte importante de nuestra agrobiodiversidad. Los PANC se caracterizan por tener especies comestibles nativas, exóticas o naturalizadas, espontáneas o subespontáneas. Las subespontáneas se consideran malas hierbas o malas hierbas, y muchas veces se descartan.

Conclusión:

Esta publicación concluye que el cultivo y consumo de la PANC es una nueva alternativa segura y saludable que podemos incluir en nuestra dieta. El fortalecimiento de las acciones relacionadas con la seguridad alimentaria y nutricional es un punto importante para promover el consumo de alimentos sustentables, además de promover el campo de la educación alimentaria y nutricional.

Palabras clave: Nutrición deportiva, alimentos sostenibles, plantas alimenticias no convencionales, seguridad alimentaria y nutricional

2th of December (Thursday)

STATISTICAL VALIDATION OF THE ADULT DEVELOPMENTAL COORDINATION DISORDER/DYSPRAXIA CHECKLIST (ADC) IN CZECH LANGUAGE

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Introduction:

Developmental Coordination Disorder (DCD) also known as developmental dyspraxia, affects about 6-10 % of children, of whom 2 % are severely affected (boys more often than girls; 4:1). DCD causes difficulties in activities of daily living, learning new skills, performance in sports and coordinated movement in general. DCD is usually diagnosed in childhood, most commonly through standardised testing using the Movement Assessment Battery for Children (MABC-2). This testing can be used from 3 to 16 years of age. There is no cure for DCD and children become adults with DCD. A questionnaire for the evaluation of dyspraxia has been standardized for the adult population - the Adult Developmental Coordination Disorder/Dyspraxia Checklist (ADC). The questionnaire consists of forty items divided into three subsections. It is intended for people aged 18-40; standardized in English in 2009 for U.K. and Hebrew for Israel, but not for the Czech population.

Methods:

Professional translation and confirmation that the individual items have the same meaning as in the original language. Statistical validation (Cronbach's alpha), measuring the internal consistency of the items of each subsection and the internal consistency of the entire questionnaire. People with this disorder and healthy people were included in the research.

Results:

Number of questionnaire respondents 216 in age from 18 to 40 years, 105 respondents were diagnosed or self-reported with DCD/Dyspraxia – like symptoms. The results indicate sufficient internal consistency and at the same time a healthy degree of variability. This corresponds to values between 0,7-0,95.

Conclusion:

In conclusion, the questionnaire can be used as one of the diagnostic tools for determining dyspraxia. This questionnaire represents the first step screening tool for DCD in czech language.

Key words: statistical validation; developmental dyspraxia; checklist

VERIFICATION OF THE MABC-2 IN CHILDREN WITH ASD AGED 7-10 YEARS IN THE CZECH SOCIO-CULTURAL ENVIRONMENT

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Introduction:

Motor competencies play a key role in the development of children with autism spectrum disorders (ASD). Delay in this area significantly affects the quality of life of these children, not only in adolescence but in adulthood. It is necessary to objectively measure as well as to evaluate the indicators of motor competency and the quality of skills, especially for the application of appropriate physical and social intervention. The main aim of this research was to verify the standardized Test The Movement Assessment Battery for Children-Second Edition (MABC-2) in children with ASD aged 7-10 years in the Czech socio-cultural environment.

Methods:

The participants included 8 children (n=8, 1 female, 7 males) with diagnosed ASD, aged 7-10 years. Gross and fine motor skills were evaluated using the standardized Test MABC-2, Age Band 2 (AB 2) followed by a repeated qualitative analysis of video recordings. Participants' reactions were noted.

Results:

The feasibility of all test items in the standardized motor Test MABC-2 was recorded in only 2 participants. The results are presented through the case studies of the participants. The reasons for the impracticability of the Test MABC-2 were most often: 1) low motivation to perform all movement tasks, 2) failure to complete the test due to loss of motivation, 3) failure to understand the instructions for performing a movement task. Modifications of the process and administration of the Test MABC-2 were determined based on repeated video analysis.

Discussion & Conclusion:

The process and administration of the MABC-2, AB 2, in children with ASD aged 7-10 years require adjustments to increase the feasibility of the test and its diagnostic possibilities. Modifications were implied to the standard MABC-2 test protocol in the administration process, using key principles of structured learning and the TEACCH method: Individualization, Structuration, Visualization, and Motivation. Further verification of the proposed process of modifications and the standardized MABC-2 administration in children with ASD aged 7-10 years is required.

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motoriky pro děti. Praha: Hogrefe–Testcentrum.

Keywords: ASD, MABC-2, motor assessment, TEACCH, structured learning.

PHYSICAL ACTIVITY IS A PROTECTIVE FACTOR FOR PSYCHOSOCIAL RISKS AMONG SCHOOL STUDENTS DURING QUARANTINE

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Introduction:

A year of COVID-19 has affected many areas of people's lives around the globe. School students have been particularly affected in terms of their relationships with the social environment, learning outcomes, and mental health. A longitudinal study in Australia indicated that adolescents experienced significant increases in depressive symptoms and anxiety, and a significant decrease in life satisfaction through the period right before the pandemic in 2019 and at the beginning of the pandemic in Spring 2020 (Magson et al., 2021). These findings were particularly pronounced among girls. Magson et al.'s (2021) study observed that physical activity was among the protective factors for students' well-being. It is well-known that physical activity positively affects some aspects of mental health like anxiety, cognitive functioning, cognitive performance, and academic achievement. On the contrary, sedentary behavior is associated with poorer mental health (Biddle & Asare, 2011).

Methods:

The population-based cross-sectional study across Lithuania included 1483 school students from 10 to 18 years old, 43.1% of whom were boys. The World Health Organisation - Five - Well-Being Index (WHO-5; Topp et al., 2015), a short self-reported measure, was employed to identify the current psychological well-being of the cohort. Items to measure social relationships were used to identify students' relationships with parents, teachers, and peers, each being presented as a separate question. The number of friends a student has was an indicator of the social network. The assessment of moderate-to-vigorous physical activity (MVPA) was based on the World Health Organization (WHO) definition which states that moderate physical activity noticeably accelerates and vigorous physical activity substantially increases the heart rate (WHO, 2020) and measured in hours per week. Students were divided into adequately active (≥ 7 h/week) and inadequately physically active (< 7 h/week). Sedentariness was identified by hours per day spent sitting. The Kessler 6 scale was used to identify psychological distress. Learning-related and sociodemographic data were also collected. Descriptive statistics, chi-square test, Pearson r correlation were performed. Statistical significance was set at a p-value of less than 0.05.

Results:

Analysis revealed that boys and younger students were more physically active than girls and older students. On average, students were sedentary for 8.5 h/day with only 23,4% of students being adequately physically active. Students that have more friends were more physically active

and less sedentary than those having fewer friends ($p < .05$). Students who had better relationships with their parents, teachers, and friends were less sedentary ($p < .05$). Although physical activity was not related to perceived academic achievements ($p > .05$), it was related to higher learning motivation ($p < .05$) during the period of distance learning. Students having more emotional, attention, behavior, and communication difficulties are less physically active ($p < .05$). Finally, adequately physically active and less sedentary students had higher psychological well-being ($p < .05$) and lower psychological distress ($p < .05$).

Conclusion:

Only around a quarter of school students aged 10 to 11 years old met the recommendations of physical activity. The adequately physically active students had better mental health and higher learning motivation. Those having better relationships with their social environment were less sedentary.

Keywords: Psychological well-being, psychological distress, sedentariness, physical activity, social relationships.

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-DNR-20-8.

SPORTS NUTRITION: WHERE ARE WE? WHERE DO WE GO?

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Sports nutrition is part of the sports sciences. Sports nutrition is an independent scientific discipline that has its structure, specific language and terminology. Recent findings change established terminology (e.g. carbohydrate income vs carbohydrate availability, energy balance approach vs energy availability or autonomous vs limited drinking regime). Furthermore, most recent recommendations have moved from a “one size fits all” approach to a more personalized one. However, the transfer of scientific knowledge into practice encounters a different pace of adopting new nutritional strategies by athletes and confirming their effectiveness by scientists. Advances in technologies that allow monitoring carbohydrate needs and assessing energy availability accelerate the accessibility of information to personalize sports nutrition. However, this discrepancy may be challenging as athletes in the field are vulnerable to misinterpreting the science. In contrast, an evidence-based approach adopted by sports nutritionists (e.g. diagnosis of low energy availability) helps screen athletes at risk of Relative Energy Deficiency in Sport syndrome.

Keywords: Energy availability, periodized nutrition, personalized approach, RED-S syndrome

BEHAVIOUR CHANGE MODELS AND PHYSICAL ACTIVITY PROMOTION

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Many people are involved in supporting and encouraging changes in the health-related physical activity behaviour of others, while many seek to change their own inactive behaviours. In doing both, they may seek the support of others. It is important to identify effective approaches and strategies that motivate change and sustain newly adopted healthy behaviours (National Institute for Health and Clinical Excellence [NICE], 2007) to ensure that policy and practice is guided by theoretically based knowledge and interventions.

There are a number of approaches, models and theories to explain behavior, such as a) Ecological Approach, b) Transtheoretical Model, c) Social Cognitive Theory (sub-theory of the Self-Determination Theory - SDT), d) Theory of Planned Behaviour (TPB), and so on.

Personal, social, and environmental factors that influence behaviour can be assigned to three levels: 1) Personal or individual level: beliefs, knowledge, attitudes, skills, genetics, 2) Social level: interaction with other people, autonomy support including friends, family and the community, 3) Environmental level: the area in which an individual lives, e.g., school, workplace, local shops and facilities, and wider factors including the economy (such as prices) and technology.

Behaviour change is generally best served by a mix of interventions: a) Develop and disseminate recommendations by experts/researchers, b) Environmental and social planning by local authorities, c) Communication / marketing by mass media, d) Legislation by the government.

In conclusion, physical activity promotion can be achieved by a) Education, b) Persuasion via appropriate communication (cognitive, affective, and behavioural levels), c) Motivation, creating positive motivational climate, and d) Incentives. Achieving optimal physical activity should be rewarded, as should reducing sedentary behavior to an optimal level in line with WHO (2008) recommendations.

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HOMEWORKING DURING A GLOBAL PANDEMIC - IMPACT ON PHYSICAL AND MENTAL HEALTH IN HEALTHCARE WORKERS

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Introduction:

The aim of this project was to examine the impact of home/agile working on the mental and physical health of healthcare staff, who worked from home, in the UK, during the covid-19 pandemic (April 2020 - April 2021). There is a lack of evidence on modifiable lifestyle factors that may enhance physical and mental health and wellbeing and inform strategic public health initiatives to promote short and long-term health outcomes.

Methods:

One hundred and seventy-three Health and Social Care staff across the North of England responded to an online survey administered through the University of Sunderland Qualtrics platform between April 2020 - April 2021. The survey included indicators of mental distress (Kessler-10), well-being (WHO5), self-perceived general, physical, and mental health, body mass index and musculoskeletal problems alongside measures of health behaviours including diet, physical activity, sedentary behaviour, sleep, smoking and hydration. Demographic variables included gender and age.

Results:

Psychological distress and well-being were assessed at two time points: April 2020 [UK National Government Lockdown 1] and April 2021 [UK National Government Lockdown 2/3]. 87 (51.2%) participants did not complete the WHO5 or Kessler-10 questions. The WHO5 wellbeing scores for April 2020 ranged between 4 and 25. The mean well-being score was 15.4 indicating a positive level of subjective wellbeing. Wellbeing scores during the second/third Government Lockdown (April 2021), were significantly lower (13.2; $p=0.01$, ES 0.42) than those reported in April 2020. 15 (19%) of the participants indicated levels of psychological distress that were moderate or higher. 10% reported a high level of psychological distress. Scores on the K10 psychological distress measure ranged between 10 (the lowest possible) and 39 (April 2020) and 43 (April 2021). The mean score was 17.7 in April 2020 and 18.1 in April 2021, indicating participants were likely to be well. 101 (59%) participants reported at least one musculoskeletal problem with the neck 76, 45%), shoulder (78, 46%) and lower back (66, 39%) the most common regions for pain. Psychological distress scores did not differ significantly in those reporting MSK pain. The likelihood for MSK problems appeared to increase with age. Mean weight gain was 5.9 kg and 4.9 kg for males and females respectively. Mean weight loss was 6.0 kg (male) and 4.8 kg (females). Those with moderate or severe psychological distress were more likely to gain between 5.0-6.4 kg body mass. Little change observed in BMI: 27.6 kg.m² before lockdown 1 and 27.1 kg.m² during lockdown 2. The lowest mean BMI (17.3 kg.m²) was observed in the 45-54 age group.

Discussion:

COVID19 has opened up new and unique ways of working and fresh challenges as we continue to navigate our way through the on-going pandemic. Our research demonstrates deterioration in physical and mental health of healthcare employees when working from home.

Keywords: Covid-19, working from home, health and social care

COVID-19 AND ITS EFFECTS ON BEHAVIORS AND HABITS TOWARDS PROPER NUTRITION, ALCOHOL CONSUMPTION AND SMOKING IN OUR STUDENTS.

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Introduction:

Like all the Western Balkan countries after the great political changes of 1990-1991, Albania has also undergone great economic, political and social changes. These have included changes in nutrition, both in terms of its quantity and quality. The change of the political system or in other words the free-market economy created new economic perspectives, increased the basic living standards, increased the number of motor vehicles in circulation. This not only increased environmental pollution but also increased the passivity of Albania's population: a lack of physical activity which has been associated with overweight and obesity in all age categories. Improper behaviors towards healthy eating and physical inactivity have the greatest impact on children and young people.

Methods:

The purpose of this study, which is conducted almost every year with students of the Faculty of Physical Activity and Recreation, was to identify the prevalence of overweight and obesity, and alcohol and cigarette consumption in first year bachelor students. The focus of the study was also to identify whether the corona virus pandemic has contributed to the findings. Participants were 140 students (58.75%, 82 male and 41.42%, 58 female), with a mean age of 18.69 years, who were chosen randomly during October-November 2021.

Results:

This study showed that the majority of students (75.45%) were within normal weight ranges (71.4% male students compared to 79.5% female students). The prevalence of overweight and obesity was not common among male students compared to females (24.2% and 13.7% vs. 3.5% and 2.1%, respectively). In contrast, 4.7% female students were underweight as compared to 0.9% males. Eating habits of the students showed that the majority (76%) reported taking meals regularly. Female students reported healthier daily breakfast eating habits, 40.11% of female students reported eating breakfast daily compared to 48.22% of male students. Intake of fruit and vegetables was below the European average consumption. A gender difference of 11.08% was also noted in the daily intake of green and colored vegetables (41.35% females vs. 30.27% males). Male students reported drinking alcohol more often (2 or 3 times per week) compared with female students (male n=6.11%, female n=3.97%). More female students indicated that they rarely drank alcohol (n=65.32%) compared with males (n=50.06%). Approximately 64% of our students never smoked, with 13.21% of males rarely smoking

compared with 9.64% of females. At least one packet of cigarettes was smoked by 29.72% of male students compared with 19.55% of females.

Discussion & Conclusion:

Although the overall prevalence of overweight and obesity in the sample studied is low, the results show that some sports university students may benefit from studying a sports nutrition module as well as nutritional and health promotion programs to reduce this tendency, especially in male students. We think that the increase in alcohol and tobacco consumption compared to the results of our last study in 2019 is likely to be related to isolation during Covid-19, either through boredom or to cope with increases in stress and anxiety which have been reported in all categories of the population.

Keywords: pandemic; diet; obesity

ORGANIZATION OF FUNCTIONAL AQUA FITNESS CLASSES FOR WOMEN IN GYM (ON LAND) AND IN THE WATER IN A SPORTS POOL

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Aim:

The purpose of work was to develop a program on functional aqua fitness for women on land and in water and to experimentally determine its effectiveness.

Methods:

Analysis of scientific and methodological literature will be conducted followed by a survey of two groups of women: an experimental group and a control group. Anthropometric data was gathered as were measures of physical fitness. Statistical analysis was undertaken to identify if there were any differences between the two groups.

Results:

The analysis of the literature and various aqua fitness programs, as well as the data obtained by us as a result of preliminary testing of the features of the physique of women, their level of functional state and physical fitness formed the basis for the development of a program of functional training with women in a sports pool. At the end of the experiment, the women of the experimental group noted an increase in overall performance, a decrease in shortness of breath, a decrease in body weight, no back pain, , increased mobility in the joints, and normalization of blood pressure. The results of the formative pedagogical experiment revealed statistically significant positive changes in the development of physical qualities, especially endurance, strength abilities and coordination.

Discussion & Conclusion:

Despite the existing variety of water programs, there are currently difficulties in their practical implementation in the context of a pandemic. Therefore, it is necessary to develop such universal programs that take into account the individual characteristics of women and do not impose strict requirements on the level of swimming and physical fitness of those involved with the possibility of classes in the pool.

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IMPACT OF WHOLE-BODY ELECTROMYOSTIMULATION AND RESISTANCE TRAINING ON BONE MINERAL DENSITY IN WOMEN AT RISK OF OSTEOPOROSIS

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Introduction:

In recent years, there has been an increasing interest in physical activity programs for elderly people. Questions have been raised about the efficacy of programs with regards to real effects on life.

Aim:

The purpose of the study is to compare the effect of ten weeks of Whole-Body Electromyostimulation (WB-EMS) and resistance training (RT) programs on bone mineral density (BMD) and T-score values in women at risk of osteoporosis.

Methods:

The WB-EMS was carried out once per week (total: ten sessions), the RT was carried out twice per week (total: 20 sessions). Twenty-eight elderly women participated in the study, nine in a WB-EMS group (weight: 69.84±10.29kg; BMI: 25.04±4.18 kg/m²), eight in a RT group (weight: 74.16±4.19kg; BMI: 27.35±2.76 kg/m²), and ten in a control group (CG) (weight: 79.72 kg; BMI 28.58±5.70 kg/m²). A dual-energy X-ray absorptiometry scanner (DXA) was used to assess body composition, BMD, and T-score values. To identify the statistical significance of the differences between pre-test and post-test in all groups the parametrical t-test was used. Statistical significance was set at $p \leq 0.05$.

Results:

Although no significant differences were found in either BMD or T-score values, the study appeared to elicit some positive behaviour that could have an impact for more than ten weeks.

Conclusions:

The present study was designed to determine the effect of RT and WB-EMS on selected parameters in groups of women at risk of osteoporosis. Even though the results were not statistically significant, we consider the effect of programs on the level of BMD and T-score beneficial. Results show that the RT method is more practical. More tested subjects of the RT

reported the same or higher level of BMD in the post-test compared to the WB-EMS method (RT 50 % vs WB-EMS 44.7 %). It was not possible to investigate the significant relationships of selected parameters and intervention further because the sample size was too small. A further study with more focus on the duration of intervention and with an increase in sample size is therefore suggested.

Keywords: Ageing, BMD, DXA, resistance training, WB-EMS

Acknowledgements:

This article was written at the Faculty of Sport Studies at Masaryk University Brno, Czech Republic, as a part of the internal project „Effectiveness of whole-body electromyostimulation (WB-EMS) in people at risk of sarcopenia” (MUNI/0549/2019). All rights reserved.

A LEVEL OF ASSURANCE OF SELF-DEFENSE INSTRUCTORS FOR WORKING WITH PEOPLE WITH SPECIAL NEEDS

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Introduction:

The number of attacks on people with different types of special needs in the world is growing. This results in increasing requests for self-defense courses created for groups of people with disabilities. Most self-defense systems dealing with specific groups focus on women or the elderly. People with disabilities are rarely considered or included. The aim of this research is to find how self-defense instructors feel to work with specific groups, including people with disabilities.

Methods:

This research involved 65 respondents (52 men and 13 women). Self-assessment of the ability and willingness to lead, communicate or organize self-defense courses for individual groups with special needs or willingness to integrate these people into regular self-defense lessons were evaluated by a created questionnaire. Descriptive statistics were used.

Results:

Results showed that self-defense instructors do not feel very prepared to work with specific groups, except for self-defense of women, children, and the elderly. The instructors are the most concerned about working with people with intellectual disabilities.

Conclusions:

For improvement, targeted education and training focussed on working with people with disabilities is necessary. This would provide a level of assurance among self-defense instructors for working with people with special needs.

Keywords: Competence, self-defense, people with special needs, specific groups

Acknowledgements:

This article was written at the Faculty of Sport Studies Masaryk University Brno, Czech Republic, as a part of the internal project „The Competence of self-defense instructors to work with people with special needs” (MUNI/A/1656/2020). All rights reserved.

WOMENS' AND GIRLS' PARTICIPATION IN SPORT AND PHYSICAL ACTIVITY:THE IMPACT OF THE MENSTRUAL CYCLE

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There are many sex-specific differences in physiology, anatomy, and psychology between males and females. While recent years have seen a rise in the number of women participating in sport, women continue to be under-represented in all research areas allied to sport and exercise. Women who take part in sport or who exercise would benefit from guidelines that are specific to their needs. Over the last few years, there has been a greater focus around female health and, in particular, the menstrual cycle and its effects on participation in physical activity at all levels. This paper will consider the topic of the menstrual cycle, what it is, its function and the importance of understanding the role of the menstrual cycle in sport and physical activity. It will outline our current understanding of the objective impact of the menstrual cycle on sporting performance as well as the lived experiences of female athletes. It will highlight the multiplicity and individuality of menstrual-related symptoms. In sport, there is need for athletes, coaches, and support staff to have heightened awareness and understanding of the menstrual cycle and associated issues. In wider society, parents, schools, and other education institutions also have a role to play to improve the health, wellbeing and sporting opportunities for women and girls. The paper proposes a direction for future research.

Key words: Exercise; female health; menstrual symptoms

AGING AND OBESITY: THEIR LINKS AND LIFESTYLE STRATEGIES TO COUNTERACT THEM

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Evidence from several studies have shown that increases in life expectancy are now accompanied by an increased disability rate. The expanded lifespan of the aging population is accompanied by a continuous increase in chronic diseases.

Study on animal models suggest that caloric restriction or intermittent fasting may represent a strategy to retard the aging process. On the contrary, with aging there is a trend toward increased weight both in humans and in captive animals. Additionally, the prevalence of overweight and obesity among humans is increasing at an alarming rate in many parts of the world.

Further to increasing the onset of metabolic imbalances, obesity leads to reduced life span and affects cellular and molecular processes in a fashion resembling aging.

We will try to answer an apparently simple question: which weight range should be considered the “healthiest” for our species? By being able to answer this question, we will contribute to the picture of what the **correct lifestyle for a healthy life span** is.

Key words: longevity, life span, caloric restriction, intermittent fasting, body weight, body mass index

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CONDITIONING IN SOCCER

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The purpose of this paper is to describe the organization and function of high-performance systems in team sports, but also the performance specialists' professional titles, education and employment opportunities. The paper will also describe the performance system as a part of overall sports preparation (strength and conditioning, mental training, sports medicine, recovery, nutrition, assessment IN TEAM SPORTS training monitoring, life performance, big data management, facility and equipment management, travel management), considering the performance system to be a service to skills and competition performance.

DIFFERENCES IN SITUATION-RELATED INDICATORS OF THE HANDBALL GAME IN DIFFERENT TOURNAMENT DESIGNS AT EUROPEAN MEN'S CHAMPIONSHIPS 2018 AND 2020

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Introduction:

Handball, as a sport-game according to classifications of structure complexity, is classified as a multi-subject complex sport activity due to its complexity of movement and situation structures (Ohnjec et al., 2015). Situation-related game elements are presented by indicators of technical-tactical activities performed under authentic game or competition conditions. The bi-annual European Men's and Women's Handball Championships started with 12 teams in 1994 and were expanded to 16 teams in 2002. For the first time, the European Championships was expanded to 24 teams in 2020 but was organized according to the same structure for a given number of competitors. That means, that each format contains two group stages. Groups are round-robin tournaments with all teams playing once against any other team in their group, the results of the matches played in the preliminary round between teams of the same main round group are carried over to the main round (Csato, 2021). The study aims to compare different designs for the European Men's Handball Championships, including a change of design between the two recent championships in 2018 and 2020. The aim of the research study has been to analyse the differences in situation-related indicators of the handball game on attack and on defence on a relevant sample of top-quality matches.

Methods:

The investigation was conducted on a sample of 47 matches from the 2018 and 65 matches from the 2020 Men's European Handball Championships. Variables have been presented by 12 situation-related technical-tactical activity indicators collected by the official game statistics surveillance, or better to say, by the analysis executed on the match course computer protocols from these competitions. The basic central and dispersive parameters have been calculated. As for the differences in the variables, they have been determined by the T-test for independent samples of the software package Statistica 14.0.

Results:

Independent t-test results revealed that there was no significant difference ($p > 0.05$) in nine situation-related indicators between 2018 and 2020 Men's European Handball Championship. However, significant differences ($p < 0.05$) were found between three situation-related indicators (6m Centre shots, steals and turnovers).

Discussion & Conclusion:

The research sought to clarify situational efficiency in handball game by analyzing registered frequencies and values of the observed variables in different designs for the European Men's Handball Championships in 2018 and 2020. Results of this research showed that higher number

of matches and teams in 2020 didn't show too many differences in observed variables, and situational parameters are mainly constant regardless of the different design of the competition.

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MENTAL TOUGHNESS OF YOUNG FOOTBALL PLAYERS: DIFFERENCES REGARDING THEIR AGE AND SPORTS EXPERIENCE

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Introduction:

Doing sports, especially on a professional level, requires a high level of sacrifice, motivation, belief, and mental toughness. In this article, we will focus on the latter and try to explain what mental toughness is and why it is important for young athletes. Different stakeholders in sports point to mental toughness as one of the key characteristics related to an individual's success in elite sports (Liew et al., 2019). According to Nicholls et al. (2009), developmental factors such as age and sports experience can be relevant for mental toughness. Since different studies show diverse relations among those variables, this research aimed to examine the mental toughness of young football players and determine whether players differ in mental toughness with regard to their age and sports experience. It was assumed that there were no statistically significant differences in the mental toughness of young football players with regard to players' age and years of training.

Methods:

The research was conducted in 2021 in one big football club in the Republic of Croatia on a sample of 87 young football players aged between 12 and 18 ($M = 14.47$; $SD = 2.15$) who train football from 3 to 12 years ($M = 7.99$, $SD = 2.01$). Two questionnaires were used in the research: an online questionnaire consisting of questions on players' age and years of training and the *Cricket Mental Toughness Inventory* (CMTI, Gucciardi & Gordon, 2009) adapted to football context. The overall inventory results were formed in accordance with five 3-item subscales: Affective intelligence, Desire to achieve, Resilience, Attentional control, and Self-belief, as suggested by the authors that originally designed the CMTI. The independent samples t-test was used to test two null hypotheses.

Results:

The results showed players' high self-assessments on mental toughness. On the scale from 1 (false, 100% of the time) to 7 (true, 100% of the time) total average score on 15 items of the inventory was $M = 5.82$ ($SD = 0.79$; $Min = 3.47$; $Max = 7.00$). The abovementioned five subscales had mean scores from $M = 5.19$ ($SD = 1.32$) to $M = 6.62$ ($SD = 0.73$). Young athletes differed in mental toughness with regard to their age and years of training only on the subscale *Resilience*. Younger players (12-14 years old, $N = 51$, $M = 5.98$; $SD = 1.02$) showed greater resilience than older players (16-17 years old, $N = 36$; $M = 5.49$; $SD = 1.15$) ($t = -2.090$; $df = 85$; $p = 0.040$) and players with shorter football experience (3-7 years, $N = 37$; $M = 6.12$; $SD =$

0.73) showed greater resilience than those with longer football experience (8-12 years, N = 48; M = 5.55; SD = 1.22) ($t = 2.496$; $df = 83$; $p = 0.015$).

Discussion & Conclusion:

Some studies show that elite football players have a higher level of resilience than athletes in other sports, but they do not differ in resilience regarding age and sports experience (Özdemir, 2019). According to the obtained results, the age and years of young football players' training experience are determining factors for mental toughness only in one of its five dimensions, particularly in *Resilience*. Younger players and those with shorter training experience probably have experienced fewer setbacks and difficulties in sports, so they expressed higher resilience, while it is often important for older players and those with longer sports experience to continuously achieve success in order to get the opportunity to engage in professional sports. Probably those among them who have encountered more setbacks and difficulties in sports expressed lower resilience. At the same time, practice also shows that older athletes are exposed to more competitiveness, pressure, and focus on sports results than the younger ones. Therefore, the obtained results are further discussed in the context of the importance of a differentiated coaching approach with respect to players' age and their sports experience. Bearing that in mind, coaches can help young athletes to face difficulties more easily, overcome them, and achieve success.

Keywords: Age, football, years of training, resilience

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HORMONAL RESPONSE TO SIMULATED BOXING MATCH AND RELATION TO PERCEIVED SELF-EFFICACY AND IMPORTANCE OF WINNING

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Introduction:

Studies have suggested that winners and losers have different testosterone responses to the competition outcome, with winners having higher testosterone levels than losers (the winner-loser effect). Some psychological variables have been found to moderate this effect. The present study investigated testosterone and cortisol response to a simulated boxing match in 16 healthy athletes. The association of perceived task related self-efficacy and importance of winning with the hormonal responses was also examined.

Methods:

Twenty-four male athletes (age = 23.0 ± 3.7 years, weight = 82.3 ± 9.0 kg, height = 178.0 ± 5.5 cm) volunteered for this study. Recruitment was held on Faculty XX and via sports clubs focusing on combat sports. The prize money was set at 20 euros for winners and 4 euros for losers. No participant reported having any health problems that could affect the results of hormonal testing. All participants underwent regular annual obligatory medical and sports testing.

Results:

The results did not show a winner-loser effect as losers experienced a more positive and homogenous response to a simulated boxing match. Analysis of short-term (15–60 min before the competition) anticipatory response to the following competition did not reveal any unified trend. However, the anticipatory response does not appear to be completely independent of the initial levels. The winners reported a non-significantly higher perceived importance of winning and self-efficacy, and no association was found between the importance of winning and hormonal response. Self-efficacy was positively correlated with attacking activity and cortisol response to the competition, and negatively correlated with cortisol levels obtained 60 minutes before the match.

Conclusions:

All these associations were found in winners but not in losers. Participants were acquainted with self-efficacy and the importance of winning perceived by their opponent just before the start of the match, but no correlations with the measured variables were found.

Keywords: athlete, challenge hypothesis, sports, psychological stress, martial art

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Response to the Physical Competition in Young Males” (MUNI/A/1509/2018). All rights reserved.

THE PREVALENCE AND IMPACT OF STRESS URINARY INCONTINENCE ON QUALITY OF LIFE IN YOUNG NULLIPAROUS SPORTSWOMEN PRACTICING HIGH- INTENSITY PHYSICAL ACTIVITY

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Introduction:

High intensity physical activity in several sports is considered as a risk factor for stress urinary incontinence (SUI) and other pelvic floor dysfunctions. The primary aim of this study was to determine the prevalence of stress urinary incontinence (SUI) and consequent impact on quality of life among sports women practicing high intensity physical activity.

Methods:

This cross-sectional study was conducted between September 2020 to January 2021 and included 249 sportswomen from Czech Republic in the mean age 22.18 ± 6.11 years. The basic inclusion criteria were the age 18-35 years, being nulliparous and practicing high intensity physical activity. The exclusion criteria were childbirth, surgical treatment of gynecological and urological illnesses and urinary tract infection. The sports were divided into the following six groups: 1. Functional mobilization sports (FMS); 2. Strength sports (SS); 3. Aesthetic-coordination and sensory-concentration sports (ACS); 4. Heuristic-individual and martial arts (HIS + MAS); 5. Heuristic-collective sports with a hockey stick (HCS-A); and 6. Heuristic-collective sports with a ball (HCS-B). Data was collected through the use of The International Physical Activity Questionnaire (IPAQ), The International Consultation on Incontinence Questionnaire Urinary Incontinence (ICIQ-UISF) and The Quality of Life Assessment Questionnaire Concerning Urinary Incontinence (Contilife). Descriptive and analytical statistics were applied. ANOVA test and t-test were used for obtaining p-values. The significance level was set a $p < 0.05$.

Results:

Forty-two percent of sportswomen recorded having experienced UI in their life. The symptoms of SUI according to the ICIQ-UI SF were 1.80 ± 2.93 . Between the general groups of sportswomen with and without SUI, we noticed significant differences in the quality of life assessed by the Contilife questionnaire in the overall score, but also in the sections: daily activities, physical activity, personality, emotional consequences, sexuality and quality of life with better results in the group without SUI. But there were no significant differences between the 6 sports groups in the overall score of the Contilife.

Discussion and conclusion:

Stress urinary incontinence is a prevalent condition among sportswomen. In our study the

symptoms of SUI were mild. We recorded a statistically significant impact on quality of life in the group of sports women with SUI in comparison with the group of sportswomen without SUI. There is a strong need for healthcare professionals to inform the target group of sportswomen who are at risk of developing UI about its preventive and treatment possibilities.

Keywords: Stress urinary incontinence, sportswomen, quality of life, high-intensity physical activity, SUI

RELIABILITY OF THE CZECH VERSION OF THE FALLS EFFICACY SCALE INTERNATIONAL (FES-I) AND SHORT FALLS EFFICACY SCALE INTERNATIONAL (SHORT FES-I) IN ELDERLY PEOPLE

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Introduction:

Issues about ageing populations and maintaining a quality of life into old age have been society's current issues for the last years. Self-efficacy is one of the attributes for quality of life, and it is influenced by psychological factors and physical performance. In elderly people, both are associated with fall-related concerns, which has an impact on activities of daily living. Injuries and associated problems related to falls are more likely to happen because of involution changes in older age. Thus, fear of falling is one of the factors that influence the quality of older people's life. In addition, the fear of falling is one of the fall risks. To measure the fear of falling, the Falls Efficacy Scale was developed by Yardley et al. (2005) and then successfully translated to many other languages with excellent reliability and validity (Falls Efficacy Scale International (FES-I). Even the shortened version (Short FES-I) which uses seven instead of 16 items, has shown excellent reliability and validity and is often used. Reguli and Svobodová (2011) translated the FES-I to the Czech language. This study's aim was to determine the reliability of the Short FES-I and FES-I for Czech older people.

Methods:

FES-I (Czech translation) was used with 350 participants (278 women and 72 men) aged 65 and more in a test- retest study with data being collected 14 days apart. The Short FES-I results were selected from the FES-I results. Data was processed by Statistica.cz software. Descriptive statistics were used.

Results:

Results showed that Czech version of short FES-I and FES-I is a reliable tool for measuring the fear of falling in older adults.

Conclusions:

Although the czech version of FES- I and short FES-I are reliable tools, it is necessary to confirm their validity.

Keywords: Fear of falling, injuries, over-65s

DEVELOPMENT OF PHYSICAL CULTURE AND SPORTS IN THE PSKOV REGION FROM 2016 TO 2021

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Introduction:

According to ROSSTAT data for 2019, Pskov region is ranked 46th among the other regions of Russia in terms of sports and physical culture activities, but these data should not sound horrifying, since, according to statistics provided by the well-known “Soviet Sport” journal in 2016, Pskov region was in ranked 81st.

Aim:

The aim of this study is to analyze statistical data and other indicators that affect sports development in Pskov region.

Methods:

Analysis of literature and Internet resources on the Olympic movement of Pskov region, analysis of statistical data on sports in Pskov region.

Results:

Pskov region, despite its low position in the ratings of Rosstat and the newspaper “Soviet Sport”, shows a significant growth and popularization of physical culture and sports among the population, and this was defined using such factors as the number of:

- sports schools, clubs,
- sports federations,
- sports facilities.

Discussion and Conclusion:

It was found out that there is a large number of outstanding athletes in the region whose achievements are immortalized in the Museum of Sports and the Olympic movement of the Pskov region. More and more young people are attracted by this. A great influence on the formation of sports and coaching personnel is also exerted by Velikie Luki State Academy Physical Culture and Sports. At the moment, the national project "Demography" and federal and regional projects "Sport is the Norm of Life" are being implemented in the region, aimed at attracting as many people as possible to sports. This is being achieved through the construction and repair of sports facilities and structures, financing sports organizations, and holding mass sports and physical culture activities. These focused interventions remain a priority until 2024, while these projects are in operation.

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Spanish language session

INFRARED THERMOGRAPHY APPLIED TO SPORTS SCIENCE

Danielli Mello

Army Physical Education School (EsEFEx), Brazil

The use of infrared thermography has become increasingly common in sports assessment and has grown a lot over the past few years. External factors such as air temperature, radiant temperature, relative humidity, and air flow velocity affect the human body's heat transfer mechanism, and it can be assessed through skin temperature. The evaporation of sweat represents the main mechanism to reduce the skin temperature during exercise. At the beginning of exercise there may be a reduction in temperature, because of sweating on the skin surface and the use of blood in the required muscles. To analyze the thermoregulation process, and to understand how this energy is dissipated, infrared thermography can be used. Its main advantages are: non-invasive method; monitoring a specific region of interest (ROIs) (local analysis), or throughout the body (global analysis). This tool is becoming a popular technique, as it is a safe, non-invasive, non-contact and is a cost-effective measurement system. So, infrared thermography is a metabolic non-invasive method that uses the Infrared Image to identify changes in blood skin flow, that is represented by skin temperature.

The aim of this lecture is to introduce the application of infrared thermography applied to sports science and its applications in sports science for injury prevention, thermoregulation analysis, and training load. The differences in skin temperature will be explained through the map of the regions of interest, how to analyze the difference between cameras, validity and reliability of the data, which factors can influence the data collection, explain the method, how to analyze the images, and present the latest scientific papers. TISEM

Keywords: infrared thermography, skin temperature, performance

ANALYSIS OF PSYCHOPHYSIOLOGICAL STRESS IN SPORTS PERFORMANCE

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Abstract

There are more and more studies that use biotechnological devices for the analysis of psychophysiological stress. Thus, such instruments have shown high efficiency for the study of tasks of high cognitive demand, for example to analyze the psychophysiological response during takeoff, landing, air-air attack, and air-ground attack during real and simulated flights in fighter pilots. Likewise, chess has been used as a useful tool for the study of cognitive processes, such as memory analysis, perception, decision-making and problem solving. All of the above is analyzed through the analysis of explosions of gamma band activity (GBA) by magnetoencephalography (MEG), of the heart rate and of the variability of the heart rate (HRV), of different respiratory variables, of the brain waves (Electroencephalography –EEG). The following presentation aims to synthesize the state of the art on the use of biotechnological devices in the analysis of psychophysiological stress in tasks of high cognitive demand. We will discuss examples of research with chess players and with fighter pilots, observing in different studies a significant increase in HR and also a decrease in HRV; results that suggest stimulation of the sympathetic nervous system without changes in the parasympathetic system. Likewise, studies are presented that show differences at the level of brain waves between experts and novices, as well as differences that show dependant on the difficulty of the task.

Keywords: Technology, biotechnology, stress, cognitive tasks

COMPORTAMENTO DA SATURAÇÃO DE OXIGÉNIO MUSCULAR E DA FREQUÊNCIA CARDIACA DURANTE O EXERCÍCIO VIBRATÓRIO CORPORAL

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Introdução:

O exercício vibratório corporal (EVC) tem despertado interesse há várias décadas, evidências científicas, comprovam efetividade nos processos de reabilitação e potencialização do desempenho físico. Como complemento ao treino, o EVC potencializa a flexibilidade, o equilíbrio, a densidade mineral óssea e o fortalecimento muscular.

Objetivo:

Analisar o efeito agudo do exercício vibratório corporal na frequência cardíaca (FC) e na percentagem de saturação de oxigénio muscular (%SatO₂) tanto em idosos como em jovens.

Método:

A intervenção foi realizada na Universidade de Évora, em Portugal. A amostra, foi composta por idosos e jovens, que foram submetidos a uma intervenção de EVC na plataforma vibratória Galilleu a três diferentes frequências de vibração (8Hz; 12,6Hz; 18Hz).

Resultados:

Os indivíduos que fazem administração de beta-bloqueantes e, apesar de fisicamente ativos, os resultados na variável de FC mantiveram-se sempre lineares, não existindo efeito do EVC neste parâmetro. Nos restantes sujeitos verificou-se um aumento da FC nos momentos de EVC e e uma diminuição nos momentos de repouso. Na %SatO₂ existe uma tendência de decréscimo dos valores com EVC, durante as 3 intensidades. No entanto, independentemente de serem jovens ou idosos, os indivíduos treinados têm um maior decréscimo da %SatO₂ acompanhado pelo aumento da carga.

Conclusão:

O EVC tem influência na FC e %SatO₂ nas diferentes intensidades usadas (8Hz; 12,6Hz e 18Hz). Desta forma, pode ser um método de treino relevante para as ciências do desporto, no que diz respeito às alterações fisiológicas e ao desempenho dos indivíduos independentemente da sua idade.

Palavras-chave: Exercício Vibratório, Saturação de O₂ muscular, Frequência Cardíaca, Jovem, Idoso.

MOTIVACIÓN Y RESPONSABILIDAD PERSONAL Y SOCIAL EN EDUCACIÓN FÍSICA: UN PASO MÁS ALLÁ

David Manzano-Sánchez

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Abstract

El desarrollo de valores es uno de los ápices más importantes para lograr que cualquier sociedad funcione correctamente. La Educación Física en particular, es un área que por sus características especiales (el contacto directo entre alumnos, la relación docente-discente o el contexto diferente respecto a otras asignaturas) ha sido una materia ampliamente estudiada de cara a poder aplicar diversas metodologías para mejorar aspectos como los diferentes valores deportivos.

Dentro de estas metodologías, una de las más conocidas y empleadas es el Modelo de Responsabilidad Personal y Social, la cual, ha demostrado una gran evidencia científica desde el año 1985, cuando Donald Hellison, comenzó a aplicarlo, obteniendo muy buenos resultados de cara a mejorar el compromiso deportivo y la adquisición de valores con poblaciones jóvenes en riesgo de exclusión social.

Más recientemente, esta metodología se ha ido extendiendo por todo el ámbito internacional, innovando mediante el uso de esta metodología junto a otras dentro de actividades deportivas y/o la Educación Física, mostrando resultados muy buenos en cuanto a la mejora de la motivación, las necesidades psicológicas básicas, la deportividad, la intención de ser físicamente activo o la responsabilidad entre otras variables. A su vez, en los últimos años se ha ampliado el espectro hasta englobar todas las áreas/asignaturas del currículum académico, siendo pioneros en España en este ámbito y nuevamente mostrando resultados preliminares muy esperanzadores.

En la presente exposición, se buscará describir brevemente los hallazgos de esta metodología y cómo puede repercutir en una mejora de la enseñanza de la Educación en general y de la Educación Física en particular.

DERMATOGLYPHICS: CORRELATION BETWEEN SOFTWARE AND TRADITIONAL METHOD IN KINANTHROPOMETRIC APPLICATION

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Objective:

To correlate the traditional method and a computerized system of dermatoglyphic analysis.

Methods:

Sample of 15 individuals, with two investigators using two methods for each sample. The protocol by Cummins and Midlo was used with the following methods: computerized (M1) and traditional (M2). Pear-son's correlation was used to observe the correlation between a computerized system and the traditional system. Student's paired t-test was used to evaluate the reproducibility of both methods, with the aim to compare the internal variations based on two measurements obtained by two investigators for the same observation.

Results:

M1 had a greater quantitative capacity for identifying the number of lines. M1 was more efficient, with a higher level of positivity. There was no significant difference between the intra- (M1 and M2) and inter-investigator (investigator1 versus investigator2) observations, demonstrating the reproducibility and rely-ability capacity of M1. There were significant differences between the mean values of the squares of the inter-investigator differences (the amplitude of M2 was 4 times greater).

Conclusion:

These results significantly correlate the computerized and traditional methods, which qualifies M1 as the instrument for the capture, structuration of the design and analysis of the digital fingerprints through a dermatoglyphic method using the digital fingerprint marker, which is the essential condition to acceptance and scientific recognition of new instruments.

Keywords: Dermatoglyphic; Software validation; Anthropometry; Biological Individuality

DERMATOGLIFOS: CORRELACIÓN ENTRE EL MÉTODO TRADICIONAL Y EL SISTEMA INFORMATIZADO PARA LA APLICACIÓN EN ANTROPOMETRÍA

Objetivo:

Correlacionar el método tradicional y el sistema informatizado de análisis dermatoglífico.

Método:

Muestra de $n = 15$ individuos, siendo dos evaluadores vs dos métodos vs la muestra. Se utilizó el protocolo de Cummins y Midlo por los métodos: informatizados (M1) y tradicional (M2). Para observar la correlación entre los dos métodos, computarizado y tradicional, se utilizó la correlación de Pearson. Con el fin de evaluar la reproducibilidad de los dos métodos, se utilizó el test t de Student pareado para comparar las variaciones internas de los dos métodos, basado en las dos medidas obtenidas por los mismos dos evaluadores observados.

Resultados:

Se observó que el M1 presenta una capacidad mayor de identificación cuantitativa del número de líneas. M1 es más eficiente, potencializando el nivel de positividad. No hubo diferencia significativa entre las observaciones de los evaluadores intra (M1 vs M2) e inter (evaluador 1 vs evaluador 2), demostrando la capacidad de reproducibilidad y confiabilidad de M1. En la comparación de las variaciones internas de los dos métodos, existen diferencias significativas entre los valores medios de los cuadrados de las diferencias Inter evaluadores, y M2 presenta una amplitud 4 veces mayor.

Conclusión:

Los resultados sugieren que M1 es un instrumento eficaz en la captura, estructuración del diseño y análisis de las huellas digitales por el método dermatoglífico, condición sine qua non para la aceptación y reconocimiento científico de los nuevos instrumentos.

Palabras clave: Dermatografía; Validación de Software; Antropometría; Individualidad Biológica

3rd of December (Friday)

MOTIVATION AND PERSONAL AND SOCIAL RESPONSIBILITY IN PHYSICAL EDUCATION: A STEP FURTHER

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Abstract

The development of values is one of the most important aspects to make any society work well. Physical Education, in particular, is a curriculum subject that, due to its special characteristics (direct contact between students, the teacher-student relationship or the different context with respect to other subjects), has been widely studied in order to apply various methodologies to improve aspects such as different sports values. Within these methodologies, one of the best known and most used is the *Personal and Social Responsibility Model*, which has been used for scientific studies since 1985 when Donald Hellison began to apply it. It has achieved very good results, improving sports commitment and the acquisition of values with young populations at risk of social exclusion. More recently, this methodology has become internationalised, innovating through the use of this approach together with others within sports activities and /or Physical Education. Results have been very good in terms of improving motivation, basic psychological needs, sportsmanship, the intention to be physically active or responsibility among other variables. In turn, in recent years the spectrum has been broadened to encompass all areas/subjects of the academic curriculum, with Spain being pioneers in this field and once again showing very encouraging preliminary results. In this presentation, we will seek to briefly describe the findings of this methodology and how it can have an impact on an improvement in teaching at the educational system in general and Physical Education in particular.

FACTORS AFFECTING INJURY AND PERFORMANCE IN POLICE FIREARMS OFFICERS

Eddie Bradley, Saeed Fayaz, and Morc Coulson

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Introduction:

Firearms officer is a highly specialised role within the United Kingdom police forces. Officers are potentially at risk of injury due to occupational demands that place the musculoskeletal system under greater strain due to repetitive mechanical loading and localised stress. This may place an increased burden that may affect their physical and mental wellbeing.

Aim:

The aim was to identify the health and wellbeing, physical activity levels, and the incidence and severity of work-related injuries.

Methods:

Data from 96 officers were derived from an online self-report survey. General health indicators, physical activity levels using the IPAQ-SF, wellbeing using the WHO-5 Wellbeing Index score, and injury data from the previous 12-months were collected.

Results:

Thirty (31%) work-related injuries were reported with an injury rate 165 injuries per 100,000 hours worked to 30 injuries per 100 FTE. Absenteeism due to injury was limited, with half of all officers taking no time off for recovery. Twenty-nine per cent of injuries were classified as severe and the mechanism of the more severe injuries was linked to occupational demands such as manual handling of equipment and protective equipment. Officers who exercised four or more times per week reported significantly less injuries, while low physical activity levels resulted in significantly lower WHO-5 scores of wellbeing.

Conclusion:

These findings suggest that UK police firearms officers are at a high risk of occupational injury and that physical activity can play an important role in reducing injury and improve wellbeing in tactical police units. This should prompt organisational management to review current procedures to protect officers.

Keywords: Work-related injuries; IPAQ-SF; WHO-5 Wellbeing Index; occupational injury risk

MOTIVATION OF PHYSICAL ACTIVITY AMONG UNIVERSITY STUDENTS. IS THERE A FUTURE FOR ONLINE PHYSICAL ACTIVITY COURSES?

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Introduction:

Research shows that exercise has a positive effect on physical and mental health. Regular physical activity typically requires motivation, which in the short-term is mainly driven by internal and external factors. With time, these factors can contribute to a long-term commitment. The literature agrees that enjoyment is one of the most important intrinsic motivations. According to Ebben and Brudzynski, (2008) the motivation factors most often identified by American students are: healthy lifestyle, maintaining fitness and health, reducing stress and ensuring well-being. Seventy-six point one percent of students thought that physical activity would play a key role in their lives in the future. Kilpatrick et al (2005) also analyzed the motivation of undergraduates and found that students who do not compete have stronger intrinsic motivation than competitive athletes, where appearance, stress reduction, and prevention of weight problems were the strongest factors. According to Biber (2013), the Z generation's main motivations for physical activity are a healthy lifestyle, developing skills (to be perfect in something), performance, winning (overcoming others), and social recognition.

Aim:

The aim of our study is to map the motivational background of ELTE students in Hungary who have taken the non-compulsory Physical Activity course as a face to face or online course.

Hypotheses:

We hypothesized that healthy lifestyle factors are highly reflected in student motivation for both in-person and online courses. We hypothesized that we would find a difference between the students' motivation in the two courses in the factors for social recognition and competition.

Methods:

At the beginning of the fall semester of the 2021/22 school year, 190 (male: 83) in-class and 279 (male: 79) online students completed a questionnaire to elicit general background data, including the athlete's past, and included the EMI-2 (Exercise Motivations Inventory-2) questionnaire. The EMI-2 identifies 14 primarily intrinsic motivational factors.

Results:

In the responses to the EMI-2 questionnaire, healthy lifestyle, strength and endurance, and revitalization were in the first place in both groups, with high motivational values. The source of enjoyment shared 4th and 5th place with stress management. Social recognition, health risks, and competition were ranked last among students. Our hypothesis was only partially fulfilled - competition does indeed motivate students in the class-room course significantly more strongly

than those in the on-line class. While we did not find a similar difference in social recognition as hypothesized, affiliation appears to be a significantly strong motivation for the in-class students.

Conclusion:

Based on our results, students who taking a physical education course, whether in-class or virtual, share a strong motivation to achieve well-being and health through exercise. The high number of online students and survey results answer the question of whether online Physical Activity courses have a *raison d'être*. The question now is how to build this intrinsic motivation into a commitment, regardless of whether the course is in-class or virtual.

Keywords: Physical activity motivation, university students, online PE course

KEEP MOVING. THE PSYCHOLOGICAL BACKGROUND OF RECREATIONAL PHYSICAL ACTIVITY?

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Regular physical activity is essential for the maintenance of our physical and mental health. Unfortunately, we are prone to ignore it, which often leads to obesity, impaired functioning, decreased well-being, and also contributes to the development of a number of pathological conditions. This lecture discusses the evolutionary background of the psychological factors that impact the motive for and against physical activity. It describes the most important characteristics that favour regular physical activity, such as intrinsic motivation, the flow experience, perceived control, relatedness to nature, and the pleasure directly evoked by aerobic physical activity. These factors lead to a positive affective state during exercise, which acts as a reinforcer of regular physical activity. Also, they contribute to commitment to physical activity, the most powerful predictor of regular recreational activity. From a practical point of view, promotion and utilisation of these factors can help us to maintain the regularity of recreation physical activity.

RELATED OUTCOMES OF STRENGTH TRAINING IN CHILDREN AND ADOLESCENTS

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² *University of Trás-os-Montes & Alto Douro, Portugal*

Abstract

Muscle strength is an essential element of any movement, whether in sport or in daily activity. However, despite its trainability, an aspect often studied in adults, the same is not verified in the strength training development in youth. Currently, there is a wealth of information available, often contradictory, about what is safe or appropriate for pre-and post-puberty strength training and development. In this point of view, we will briefly discuss some of the current and relevant literature and provide evidence-based practical recommendations for resistance exercise training in children and adolescents, according to international recommendations. The results revealed that the child is, from a biological and metabolic point of view, a non-specialized organism, where adaptations occur without the need for a high level of stimulation. Recent data indicate that resistance training programs, well-structured and appropriately prescribed and supervised by trained specialists, are safe and provide unique benefits for youth, such as increased strength and muscle power, reduced cardiovascular risk, helps weight control, strengthens bones, increases psychosocial well-being, improves motor performance skills, and may reduce sports-related injuries, and should be viewed as an essential component of preparatory training programs for aspiring young athletes. Current recommendations suggest that school-aged youth should participate daily in 60 minutes or more of moderate to vigorous physical activity that is safe, effective, and enjoyable. Regular participation in a variety of physical activities during childhood and adolescence can support and encourage participation in physical activity as an ongoing lifestyle choice later in life.

Keywords: Youth, exercise, resistance training, strength training, weight training

E-poster Session

OLDER CHILDREN'S INFLUENCE ON THEIR YOUNGER SIBLINGS' FITNESS

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Introduction:

In childhood, children spend a lot of time interacting with their older siblings, hence they may influence the development of their younger brothers and sisters. Some research has shown that guidance of young children by their older siblings is an efficient strategy in improving younger children's healthy habits. One major finding has shown that physical activity levels of younger children have been positively associated with the level of physical activity of the older siblings or parents (Hands et al., 2002).

Aim:

The present study aimed to identify if there were differences between children with older siblings and those who have no older siblings in motor and skinfold measures.

Methods:

The study included 108 children aged 8-10 years. Physical fitness was examined by the *President's Challenge battery*, which contains five items (*pull-ups, curl-ups, V-sit & reach, shuttle run* and *one-mile run*). *Hand-grip strength* test was performed, *body height* and *weight* were measured as well as *thigh, upper arm* and *subscapular skinfold*. Data on gender, age and sports activity of the children and their older siblings were acquired by an adapted version of *The Developmental History of Athletes Questionnaire* (Hopwood et al., 2013).

Results:

Statistically significant differences in favour of children with older siblings were found for *pull-ups* ($p = 0.005$), *shuttle-run* ($p = 0.006$) and *one mile run* ($p = 0.026$). Moreover, children with older siblings also had lower values of *upper arm* ($p = 0.027$) and *thigh* skinfold ($p = 0.028$).

Discussion & Conclusion:

The present research showed that there is a difference between children with older siblings and those who have no older siblings in motor and skinfold measures. It may be presumed that the obtained results are a consequence of the interaction of younger children with their older siblings. Children spend more time in childhood and adolescence with their siblings than with anyone else from their social surroundings (McHale & Crouter, 1996). That unique relationship profoundly influences their overall development (Berger & Nuzzo, 2008), but obviously also has an impact on the motor development of younger children.

Keywords: Children fitness, siblings

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THE EFFECTS OF RESISTANCE TRAINING ON BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN

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Introduction:

Osteoporosis is a systemic disease of the skeletal system characterized by low bone mineral density (BMD) and microarchitectural deterioration of bone tissue, which leads to a decrease in bone strength, bone fragility, and an increased risk of fractures (D'Amelio et al., 2013; Stanforth et al., 2016). Depending on its cause, osteoporosis can be divided into two types: primary and secondary osteoporosis. *Primary osteoporosis* accounts for as many as 95% of cases, and it is either postmenopausal (Type I), which affects women within 15 to 20 years after menopause (Riggs & Melton III, 1986), or related to age or lifestyle factors such as a physical inactivity, smoking, inadequate nutrition and alcohol consumption (Ribom & Piehl-Aulin, 2010). It is estimated that more than 200 million women worldwide suffer from osteoporosis (IOF, 2017). Infact, this silent disease is three times more common in women than in men (WHO, 2007), partly because women have a lower maximum bone mass, and due to hormonal changes that occur at menopause. Osteoporosis represents a serious socio-economic burden (Dixon, 1992; Riggs & Melton III, 1992). Therefore, an effective, safe and inexpensive method for preventing or delaying osteoporosis is always welcome, and since a bone modeling is sensitive to mechanical loading, a regular exercise, and especially weight-bearing, i.e. resistance training with its positive osteogenic effects, is such a method.

Aim:

This evidence-based literature review was conducted in order to systematically map the research done in this area and to see what the minimum amount of time period of resistance training is necessary for slowing down the inevitable osteoporosis in postmenopausal women with or without calcium supplementation and/or hormone therapy.

Methods:

Five electronic databases (PubMed, MEDLINE, ERIC, SCIndex, and ScienceDirect) were searched, and search terms included 'menopause', 'postmenopausal women', 'osteoporosis', 'bone mineral density', 'bone mass', 'resistance training', and 'weight-bearing training'. Inclusion criteria were controlled trials, postmenopausal women, with or without calcium supplementation and/or hormone therapy. A review of the available literature was undertaken in accordance with the PRISMA guidelines and PEDro Scale was used for determination of studies' quality.

Results:

A total of 10 studies met the inclusion criteria with a combined sample of 685 postmenopausal women. Of these 10 studies, six had fewer than 50 respondents; the shortest study lasted six months and demonstrated an improvement of BMD, so as the longest one, which lasted for two years. Calcium supplementation (800 up to 1200 mg per day) was used in the protocol of two studies, which demonstrated good results in combination with exercise, and applied hormone therapy (i.e. estrogen, progesterone) in three studies had positive outcome concerning BMD even in control groups. In most of the selected studies, a training program has been conducted three times a week which proved to be week training optimal number if maintaining or increase of BMD in postmenopausal women is goal. When it comes to the duration of single training, in most of the studies with positive outcome, a training session lasted 60 minutes. All of the studies found a positive effect of resistance training on BMD variously in the lumbar spine, hips, and forearms.

Discussion and Conclusion:

Bone metabolism is significantly affected by type, duration, and intensity of regular physical activity, resulting in an adaptation of bones in terms of shape, mass, and strength to the mechanical loading (Faenza et al., 2020), which made it the most researched non-pharmacological method in the fight against osteoporosis. Also, it is clear that the effects of weight-bearing activities, such as strength training and resistance training, are the most commonly examined, and much less attention is given to aerobic or balance training, although balance plays a major role in fall prevention in elderly people with osteoporosis (Hsu et al., 2014). The results of previous research show that both types of weight-bearing activities lead not only to prevention of further bone demineralization in postmenopausal women, but also to increased mineralization. From the results of these studies we came to conclusion that resistance training is good not only for the preservation of BMD, but that resistance training during a period not shorter than six months (with or without calcium supplementation and/or hormone therapy), if conducted three times a week, 60 minutes per session, leads to an increase in both total and regional BMD in postmenopausal women.

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Keywords: menopause, osteoporosis, bone density, exercise

PROBLEMS AND ADVANTAGES DURING ONLINE EDUCATION IN THE FIELD OF SPORTS SCIENCE

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Introduction:

In a short time, higher education has had to adapt to the dramatically changed circumstances caused by the pandemic situation and switch to online education. It had a considerable influence on departments in which the taught curriculum is based on practical skills, such as Bachelor and MA studies in the field of sports science and teacher training. In these cases, special ideas were required in connection with teaching arrangements. In our research, we drew several conclusions from the information about the new forms of education and new ways of learning arrangements provided by would-be teachers and students in the field of sports. Our aim was to identify practices and apply the most advantageous solutions in the future.

Methods:

We created a questionnaire including the following groups of questions: demographic data, available equipment for students, their opinions about requirements, the communication between teachers and students, the accomplishment of the courses, students' learning habits and the changes of their earlier habits, and the possibilities of physical preparation. Participants were studying in the field of sports at ELTE PPK in Szombathely and Budapest at the time of our research, or they were undertaking teacher training in the major of Physical Education. Additionally, the sample included other universities' students from different countries (Poland, Czech Republic, Spain, Pakistan) specializing in sports. A total of 615 participants completed our questionnaire (226 Hungarian and 389 foreign students).

Results:

In terms of available electronic devices students did not report any difficulties with 90% of the students surveyed having appropriate equipment. By contrast, the students reported that their heavy workload exceeded the workload of previous semesters. The increased time for studying reflected this fact. Online lessons, tasks and dissertations were daunting challenges for the lecturers. According to students' opinions online education did not seem more exciting or creative (2.8 on a 6-point scale). Views on the different education and teaching platforms were divided equally. Students reported that they did not find difficulties in navigating between the platforms (3.66 on a scale of 6).

Discussion and Conclusion:

One of the most important characteristics of sports experts is their ability to problem solve, which was definitively proved recently. From the perspective of students and lecturers, we have

gone through, and we are still in a difficult period. It is advised that experiences gained in recent times should be integrated into the solutions for the future.

Keywords: Pandemic situation, sport students, opinion, Covid-19

SUSTAINABILITY ASPECTS AT AN INTERNATIONAL INDOOR GYMNASTICS EVENT.

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Introduction:

This research examined the sustainability aspects of the “8th Hungarian Grand Prix Competition” in *Gymnastics*, and the level of their implementation at this international sports event held in Hungary in the autumn 2021. The goal of our observation was to collect data about the realization of different selected sustainability indicators based on our pre-designed evaluation system during the event. This first stage research should be considered as a „test research” to check of the validity of our selected sustainability indicator categories. Our research topic can be considered to be useful as the current circumstances caused by the pandemic created additional aspects, new problems, and, especially challenging, „have-to-do” tasks for the sport event organizers. These issues have been discussed and stated also by other sources e.g Müller, Martin - Wolfe, Sven Daniel - Gaffney, Christopher - Gogishvili, David - Hug, Miriam – Lick, Annick (2021) and Taks, Marijke. (2013).

Hypothesis:

We hypothesized that sustainability principles and their implementation in general have become increasingly significant, logistically challenging issues, Moreover, it has developed a strict expectation at the organization of international sport events of any size and types e.g in elite sports and also at sport recreational or school sport events We also hypothesized that environmental issues are the most attractive considerations for prioritisation by the event organizers, while social aspects are often underestimated.

Methods:

We examined the implementation of aspects (categories) of sustainability (social, economic, environmental) and their extent according to a pre-defined criteria set. We made our conclusions by evaluating the information observed by us during the event and by evaluating the information from the media: the pre- and post-event press-releases. We have carefully adapted the criteria to the three main pillars of sustainable development (environmental, economic, social). We examined the situation of women, disadvantaged people, and treatment related to the current Covid-19 epidemic. We used a different number of aspects per pillar, from which we could easily optimize the scores. A total of 58 observation aspects were scored, the distribution of which was: 26 aspects in the environmental aspect, 13 in the economic aspect, and 19 in the social aspect. A total of 50 points could be awarded per pillar, so a maximum of 150 points could be awarded for the competition. A Likert-scale of 1-5 was used for the observation and scoring criteria.

Results:

Of the three main aspects, the economic aspect was highest scoring, accounting for almost 39,56% of the maximum score (19,78/50 points). This was followed by the environmental aspect with 52,56%. reported (26,28/ 50 points) and finally social aspects (41,12%; 20.56/50 points). Of the total 150 points available, the event received 66,63 points, indicating that this event can be classified as an “average sustainable event” based on the criteria we have developed (5/3). It is important to mention that the venue of the competition was perfectly adapted to the nature of the sport, so there was no need to make permanent alterations to the existing venue. Additional infrastructure, accessibility, number of parking lots, services, personal and property security also scored high.

Discussion and conclusion:

Based on our results it can be stated that some of the sustainability aspects of the organization of the event fell short. The data in several aspects (e.g there was not efficient selective waste collection at the venue, and the ticket system had not been thoughtfully planned and realized. Also in contrast, participants and guests had very little opportunity to explore the sights and culture of the host city due the crammed event schedule. Different planning could have given an additional entertaining, socio-cultural experience for participants. However, this was not supported due to the Fédération Internationale de Gymnastique (FIG) covid bulletin. On the other hand, in the case of general environmental aspects, the higher scores show that the issues of environmental sustainability were more acceptable by the organizers, in part confirming that our hypothesis was correct. It is suggested that the complexity of our first stage test research can be developed to become more nuanced and more reliable in a next second step. According to our data and supported by relevant literature, we suggest that further research is necessary. Additionally, the preparation of practical guidelines (a manual) for event management experts is proposed.

Keywords: Sustainability indicators, sustainable development, event management, gymnastics, pandemic

References:

- Müller, Martin - Wolfe, Sven Daniel - Gaffney, Christopher - Gogishvili, David - Hug, Miriam – Lick, Annick (2021): An evaluation of the sustainability of the Olympic Games [online]. In: *Natural Sustainability* 4. évf. p. 340-348. Hozzáférés: <https://www.nature.com/articles/s41893-021-00696-5>
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SUSTAINABILITY ASPECTS AT AN INTERNATIONAL OUTDOOR WATER EVENT.

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Introduction:

The subject of our research was the examination of the sustainability aspects of the “*International Canoe Federation (ICF) Stand Up Paddling (SUP) World Championships 2021*” and the level of their implementation at this international sports event held in Hungary in the autumn 2021. The goal of our observation was to collect data about the realization of event different selected sustainability indicators based on our pre-designed evaluation system during the event. This first stage research should be considered as a „test research” to check the validity of our selected sustainability indicator categories. Our research topic can be considered to be useful as the current circumstances caused by the pandemic created additional aspects, new problems, and, especially challenging, „have-to do” tasks for the sport organizers. These issues have been discussed and stated also by other sources e.g Müller, Martin - Wolfe, Sven Daniel - Gaffney, Christopher - Gogishvili, David - Hug, Miriam – Lick, Annick (2021) and Taks, Marijke. (2013).

Hypothesis:

We hypothesized that sustainability principles and their implementation have become increasingly significant, logistically challenging issues. They have been developed as a strict expectation at the organization of international sport events of any size and types e.g in elite sports and also at sport recreational or school sport events We also hypothesized that environmental issues are the most attractive considerations for prioritisation by the event organizers, while social aspects are often underestimated.

Methods:

We examined the implementation of aspects (categories) of sustainability (social, economic, environmental) and their extent according to a pre-defined criteria set. We made our conclusions by evaluating the information observed by us during the event and by evaluating the information from the media: the pre- and post-event press-releases. We have carefully adapted the criteria to the three main pillars of sustainable development (environmental, economic, social). We examined the situation of women, disadvantaged people, and treatment related to the current Covid-19 epidemic. We used a different number of aspects per pillar, from which we could easily optimize the scores. A total of 58 observation aspects were scored, the distribution of which was: 26 aspects in the environmental aspect, 13 in the economic aspect, and 19 in the social aspect. A total of 50 points could be awarded per pillar, so a maximum of

150 points could be awarded for the competition. A Likert-scale of 1-5 was used for the observation and scoring criteria.

Results:

Of the three main aspects, the economic aspect was highest scoring, accounting for almost 92% of the maximum score (45.92/50 points). This was followed by the environmental aspect, with more than 80% reported (40.36/50 points) and finally social aspects (73.5%; 36.73/50 points). Of the total 150 points available, the event received 123.01 points. This indicates that the event can be classified as a “sufficiently feasible event” based on the criteria we have developed (5/4). It is important to mention that the venue of the competition was perfectly adapted to the nature of the sport, so there was no need to make permanent alterations to the existing venue. Additional infrastructure, accessibility, number of parking lots, services, personal and property security also scored high.

Discussion and Conclusion:

Based on our results it can be stated that the sustainability aspects of the organization of the event fell short. For example, there was no selective waste collection at the event. Admission was free for spectators and fans of the event. The race was broadcast live online and could be seen on two screens on the site. The economic results proved to be the best, but the other two aspects were also above 70%. In relation to the COVID-19 epidemic, the current legislation was in force, so there was no obligation to cover mouths and noses with masks, nor were there any restrictions on the number and location of spectators. It is suggested that the complexity of our first stage test research can be developed to become more nuanced and more reliable in a next second step. According to our data and supported by relevant literature, we suggest that further research is necessary. Additionally, the preparation of practical guidelines (a manual) for event management experts is proposed.

Keywords: sustainable development, sustainability indicators, event management, SUP, pandemic

References:

- Müller, Martin - Wolfe, Sven Daniel - Gaffney, Christopher - Gogishvili, David - Hug, Miriam – Lick, Annick (2021): An evaluation of the sustainability of the Olympic Games [online]. In: *Natural Sustainability* 4. évf. p. 340-348. Hozzáférés: <https://www.nature.com/articles/s41893-021-00696-5>
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STAYING DRY OR TAKING THE PLUNGE? FACTORS THAT INFLUENCE PARTICIPATION IN MASTERS SWIMMING?

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Introduction:

Masters swimming offers training and competition opportunities to adults over the age of 25 years through structured programmes.

Aim:

This study aimed to identify what influenced masters swimmers to engage in training and competition.

Method:

Semi-structured interviews were used to explore the experiences of 12 masters Swimmers (8 male, 4 females; age range = 23-76 years). Data was recorded, transcribed *verbatim*, and thematically analysed.

Results:

Following analysis, a total of 237 meaning units were identified. They were located into 36 themes before being placed into 8 categories: Achieving Goals, Habituation, Health and Fitness, Organisational Influences, Significant Others, Psychological Benefits, Social, and Swim Specific. The most important findings were themes related to the impact of the coach in their participation, participants' health and fitness, the positive atmosphere inside the squad /club, competitions (for most), and socialisation.

Discussion and Conclusion:

This work has helped to identify a landscape that will assist clubs and organisations to develop and maintain masters swimming programmes. Future research is suggested to broaden the range and numbers of responses geographically and culturally, to consider masters swimming alongside other sporting and non-sporting physical activities in which older people participate and extend the work through theoretical discourse.

Keywords: Masters swimming, motives, health and fitness, habit, competition, coach, older

LONGITUDINAL STUDY OF THE MENTAL HEALTH OF THOSE EMPLOYED AS TEACHERS IN A HUNGARIAN PUBLIC EDUCATION INSTITUTION IN THE LIGHT OF THE SITUATION CAUSED BY THE SARS-COV-2 PANDEMIC, WITH A 5-ITEM WHO WELL-BEING QUESTIONNAIRE (WBI-5)

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Introduction:

Numerous studies have examined the effects of the rapidly globalized SARS-COVID virus. The Hungarian government's response to the pandemic required structural changes in education alongside changes in educational methodology. Moving away from traditional practices, educational processes have been placed in digital space - changing the practice of more than 100 years. Regarding the transformation, not only did its speed cause difficulties, but also the necessary systems and digital competences were lacking in many cases; most educators did not have the necessary ICT tools to perform everyday tasks.

Aim:

The aim was to conduct a longitudinal mixed-methods study of schoolteachers to evaluate 3 data sets and supplementary interviews for correlations between mental health indicators, burnout scale correlations, self-efficacy, and the use of online platforms.

Methods:

We used an inductive, empirical research strategy in our research. Our hypotheses focused on the correlations between mental health indicators, some indicators and burnout scale correlations, self-efficacy, and the use of online platforms. Data was collected using the Maslach Burnout Inventory (MBI) questionnaire, which was included in the Hungarian literature as the Burnout Inventory, the General Health Questionnaire (GHQ-12), which is also known as the “general health questionnaire”, and the 5 item World Health Organisation (WHO) welfare questionnaire (WBI-5). Self-completion, self-characteristic individual written interviews were conducted using closed, ranking-type questions among a randomised sample of the study population. Accordingly, out of the total number of items obtained (N = 2799), 2779 main results can be evaluated due to the acceptance of GDPR terms of use.

Results:

Regarding the scale of the research, we would like to present the results based on WHO WBI-5 at the conference.

Discussion & Conclusion:

We expect that the addition of the supplemented variables, which examine the socio-economic

status, employment conditions and certain aspects of digital education, will make the result more reliable. Our main goal is to obtain data that will serve as a basis for future research as a result of the changes brought about by the international crisis. We hope that these results will help to establish the mental health of teachers in public education and to understand the mechanisms of the situation.

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FREQUENCY OF INJURIES IN BASKETBALL - A Systematic Review

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Introduction:

Basketball is a team sport that is really demanding due to its dynamism and variety of motor, technical and tactical abilities that are necessary for the successful performance of basketball elements.

Methods:

The following databases were used to collect adequate literature: Google Scholar, PubMed. For the analysis, studies were taken that investigated the frequency of injuries in professional, semi-professional and elite basketball players. In order for the studies to meet the inclusion criteria, they contained complete data on the type of injury, localization, and frequency of injury on the tested sample.

Results:

The total number of respondents in all surveys was 3,802 respondents from all collected and analyzed previous surveys. In this study, more than 4,260 basketball injuries from 15 analyzed studies were analyzed, and after analyzing the results of these studies, it was noted that the most injuries were in the lower extremities in the amount of (66.6%), and the number of injuries in the ankle joint was (33.6%), while the second most injured part of the body was the knee (19.4%). As for upper extremity injuries, hand, finger and wrist injuries predominate (7.1%) compared to shoulder, hand and forearm injuries (5.8%). This study found that jumping/landing, turning or stopping, or contact with an opponent are the most common causes of injury in basketball players.

Conclusion:

It can be said that a large number of injuries can occur due to the increased fatigue of basketball players, so it can also be said that a proper training program can be the best prevention of injuries in basketball players. It is concluded that basketball is a sport with a high frequency of injuries.

Keywords: basketball, frequency, injuries, basketball, injuries, prevalence.

TESTS FOR ASSESSING ACCURACY IN BASKETBALL - A SYSTEMATIC REVIEW

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*2*County Hospital Čakovec, , Croatia;; *3* Faculty of Kinesiology, University of Split; Faculty of Food Technology and Biotechnology, University of Zagreb, Zagreb, Croatia

Introduction:

Basketball is a sport where the success of sports performance is reflected in the possession of technical-tactical and motor skills. Basketball shooting, which is closely related to accuracy, was previously recognized as the most frequently used and most important technique in the game. When it comes to precision, in basketball we talk about situational precision, which is seen as an integral part of technique, and it is necessary to evaluate and develop it in this way. For this reason, precision screening is a very important parameter when developing a training program.

Methods:

The following index databases were used to collect adequate literature: GoogleScholar, PubMed, MEDLINE. During the search, the following keywords were used: basketball, accuracy, tests, basketball, accuracy, testing, shooting tests. During the analysis and evaluation of the research, 16 researches were selected that corresponded to the topic and were included in the research.

Results:

All 16 studies completely met the inclusion criteria. It can be concluded that the most frequently applied measuring instruments/tests in assessing the accuracy of basketball players are: shooting from the free throw line in 60 seconds, dynamic test of free throws in 60 seconds, jump shot tests in static and dynamic conditions, test of throwing from the free throw line, but also throwing from the left and right side of the free throw line, i.e. in the 2-point area, as well as the throw/jump shot test from the 3-point line.

Keywords: basketball, accuracy, test

DIFFERENCES IN ACCURACY OF PASSING THE BALL IN YOUNG BASKETBALL PLAYERS OF DIFFERENT LEVELS OF COMPETITION

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Introduction:

This research determined the differences in accuracy between junior basketball players at the federal and regional competition level.

Methodes:

In this research, the following four tests were used to assess precision: Elevation precision of passing with one hand; Elevation precision of passing with two hands; Shooting a ball that bounces after falling from a height of 3.05 meters directly into the target; Shooting a ball that bounces after falling from a height of 3.05 meters with a mandatory bounce from the ground.

Results:

No statistically significant differences in accuracy were found between basketball players of the federal and regional level of competition, so hypothesis X1 cannot be accepted. The conclusions reached based on the discussion of the results indicate that the accuracy of passing the ball is not one of the factors that contributes to the difference in quality between basketball players in the junior age who compete in different ranks of the competition.

Conclusion:

Also, good systematic work in the clubs and good orientation and selection of basketball players in the tested clubs contribute to the quality development of motor skills in general, which do not contribute to differences in basketball players of different levels of competition in younger selections. In further work, it is necessary to further investigate precision as one of the least researched fields of motor skills.

Keywords: basketball, passing, levels

Presentations with no Abstract Submitted

ENTERMIENTO DE LA FUERZA PARA ENVEJECIMIENTO SALUDABLE EN PAERSONAS MAYORES

Pablo Marco Pardo

Catholic University San Antonio of Murcia (UCAM), Spain

MOTIVACIÓN EN EL DEPORTE. CLAVES PARA EL ÉXITO

Juan Antonio Moreno Murcia

Universidad Miguel Hernández en Elche ,Alicante, España

EXERCISE AS A PROTECTION AGAINST COVID19: ENHANCING IMMUNOLOGIC SYSTEM

João Rafael Valentim-Silva

Federal University of Rondônia, Rio de Janeiro, Brazil

NO TITLE

Richard Haiti Cabral

University Tiradentes, Aracaju, Brazil, Cardiologia, Exercício y Salud