INTERNATIONAL CONFERENCE OF

SPORT, HEALTH AND PHYSICAL EDUCATION

Book of Abstracts

October 25-26, 2018

Ústí nad Labem, Czech Republic



1st International Conference of Sport,
Health and Physical Education

BOOK OF ABSTRACTS

October 25-26, 2018
Ústí nad Labem, Czech Republic

PUBLISHED BY:

Jan Evangelista Purkyně University in Ústí nad Labem
České mládeže 8, 400 96 Ústí nad Labem, Czech Republic

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ISBN 978-80-7561-143-7
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92 pages. 150 copies.

WELCOME TO ICSHPE 2018

Dear colleagues, dear friends,

I would like to welcome you in Ústí nad Labem for the 1st year of the International Conference of Sport, Health and Physical Education. At first I would like to mention that even though it's a first year of this event, the number of active speakers in individual sections and the number of participants presenting results of their research in the poster section pleased me very much. I am very proud to see that this event has an international impact thanks to the presence of colleagues from Germany, Italy, Latvia, Norway, Poland, Slovakia, Ukraine and of course the Czech Republic. In the same way a number of active participants pleases me, I am equally as pleased with the presence of influential scientists, who participate in this conference in the role of a visitor. I believe, that goals of this conference „to create a friendly environment for all participants, to prepare an environment for the initiation of international cooperation, to acquire new findings regarding the area of sports from both the scientific and practical point of view," will be fulfilled. I think that efforts of the organizational team to prepare and carry out this conference will be successfully projected throughout the course of this event and at the same time I believe that it will fulfill the expectations of the participants.

Immense gratitude belongs to the rector of Jan Evangelista Purkyně University in Ústí nad Labem, Martin Balej and to the dean of Faculty of Education, Pavel Doulík for support in preparation and implementation of the conference. Last but not least, we are grateful to the sponsors and foreign institutions supporting our conference.

At the end, allow me to say that I am very grateful for your participation and I hope that even in the future you will be a part of our ICSHPE conference.

I wish you success during your presentations.

Štefan Balkó, *Chair of Organizing Committee*

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PROGRAM

THURSDAY – OCTOBER 25, 2018

Simultaneously interpreted from Czech (or Slovak) to English language

09:00 – 10:00 Check-in
Entrance Hall

10:00 – 10:30 Opening ceremony
Red Hall

10:30 – 11:30 Keynote Speakers
Red Hall

ASSESSMENT OF CORE STRENGTH AND POWER UNDER SPORT-SPECIFIC CONDITIONS
Erika Zemková

MOVEMENT INTERVENTION AS A TOOL OF THE INFLUENCE OF PHYSICAL FITNESS AND HEALTH
Václav Bunc

11:30 – 12:00 Sport Exhibition – Fencing
Red Hall

12:00 – 13:00 Lunch + Coffee Break
Entrance Hall

13:00 – 14:45 Session I
Red Hall

Chair: *Miroslav Petr, Charles University in Prague, Czech Republic*

DETERMINING GENDER AND DAYS DIFFERENCES IN ADOLESCENT PHYSICAL ACTIVITY LEVELS USING PEDOMETERS IN NORD-WEST BOHEMIA
Ladislav Bláha, David Cihlář

PHYSICAL FITNESS AND LEVEL OF BODY COMPONENTS IN THE 11–15 YEAR OLD POPULATION IN WEST SLOVAKIA
Nora Halmová, Janka Kanasová, Ľuboslav Šiška

LONGITUDINAL CHANGES IN PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR AND BODY FAT IN CENTRAL EUROPEAN WOMEN: PRELIMINARY FINDINGS
Jana Pelclová, Jana Hodonská, Zuzana Svozilová

PRESENT TRENDS OF QUALITY OF LIFE IN UKRAINIAN POPULATION
Iuliia Pavlova

TENSEGRITY AND MYOFASCIAL SYSTEM IN SPORT
Eva Buchtelová, Kateřina Tichá

WALKING AND BIKING IN THE CONTEXT OF SEDENTARY SOCIETY
Aleš Sekot

IMPACT OF BALANCE EXERCISES ON FUNCTIONAL MUSCULAR DISORDERS REMOVAL IN VOLLEYBALL PLAYERS
Janka Kanasová, Natália Czaková, Lenka Divinec, Alexandra Veis, Mária Solvesterová

13:00 – 14:45 Session II

Purple Hall

Chair: *Erika Zemková, Comenius University in Bratislava, Slovakia*

CONTRIBUTION TO THE DIAGNOSTICS OF FLOORBALL SKILLS OF FLOORBALL PLAYERS OF YOUNGER SCHOOL AGE
Zuzana Dragounová

CONCONI TEST – RELIABILITY AND VALIDITY ASPECTS
Jan Hnízdil, Martin Škopek, Štefan Balkó, Martin Nosek, Oto Louka, Martin Musálek, Jan Heller

SPORT TALENT IDENTIFICATION BASED ON MOTOR TESTS AND GENETIC ANALYSIS
Jaromír Šimonek, Radoslav Židek

COMPARING THE QUALITY OF STEREOPSIS IN HANDBALL PLAYERS AND SWIMMERS AT THE AGE OF 5–10 YEARS
Václav Salcman, Jan Blecha

ANAEROBIC PERFORMANCE IN 30s WINGATE TEST AS ONE OF THE POSSIBLE CRITERIA FOR CHOOSING CZECH HOCKEY PLAYERS INTO NATIONAL HOCKEY LEAGUE
Jan Heller, Pavel Vodička, Michael Janek

MATCH CHARACTERISTICS AND RALLY PACE OF MALE TENNIS MATCHES AT THREE GRAND SLAM TOURNAMENTS IN 2017
Jan Carboch, Kristýna Plachá, Michal Sklenařík, Matěj Blau

14:45 – 15:15 Coffee Break

Entrance Hall

15:15 – 16:30 Session III

Red Hall

Chair: *Ladislav Bláha, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic*

IDENTIFICATION OF PREDICTORS IN AGILITY IN BASKETBALL
Pavol Horička, Jaromír Šimonek

DIVING REFLEX MONITORING WITH CONNECTION TO FREEDIVING
Oto Louka, Jan Hnízdil, Tereza Louková

EFFECTS OF PROTEINS ON MUSCLE MASS
Miroslav Petr

ASSESSMENT OF THE COORDINATION SKILLS OF GIRLS IN DANCE SPORT
Hana Kabešová, Barbora Šišáková, Jitka Vaněčková

THE INTERACTION OF PHYSICAL ACTIVITY, JOY OF MOVEMENT AND QUALITY OF LIVE OF HIGH SCHOOL STUDENTS AND AT DIFFERENT AGES
Jaroslav Broďani, Natália Kováčová

15:15 – 16:30 Session IV

Purple Hall

Chair: *Jaromír Šimonek, Constantine the Philosopher University in Nitra, Slovakia*

QUALITY OF BALANCE AND PRESSURE DISTRIBUTION OVER THE PRESSURE PLATFORM DURING DOUBLE-LEG STANCE IN YOUNG WOMEN
Pavel Korvas

THE ASSOCIATIONS OF PARTICIPATION IN ORGANIZED SPORT AND UNORGANIZED PHYSICAL ACTIVITY IN RELATION TO PHYSICAL ACTIVITY LEVEL AMONG ADOLESCENTS
Pål Lagestad, Camilla Sandvik, Laura Suominen, Idar Lyngstad, Hilde Mikalsen

ASSOCIATIONS OF BOUTED SEDENTARY TIME WITH THE PERCEIVED BUILT ENVIRONMENT IN CENTRAL EUROPEAN OLDER ADULTS
Jana Hodonská, Jana Pelclová, Zuzana Svozilová

WHAT'S IN IT FOR ME? YOUNG TEENAGERS' MEANING-MAKING EXPERIENCES OF MOVEMENT ACTIVITIES
Hilde Mikalsen, Pål Lagestad

16:30 – 18:00 Posters

Entrance Hall

19:30 – 02:00 Social Program

Cafeteria

FRIDAY – OCTOBER 26, 2018

Simultaneously interpreted from Czech (or Slovak) to English language

10:00 – 11:00 Keynote Speakers

Red Hall

RUNNING BIOMECHANICS OF ATHLETES WITH HISTORY OF ACHILLES TENDON REPAIR
Daniel Jandačka

MARTIAL ARTS IN THE CONTEXT OF HEALTH
Jacek Wąsik

11:00 – 11:30 Coffee Break

Entrance Hall

11:30 – 13:00 Session V

Red Hall

Chair: *Daniel Jandačka, University of Ostrava, Czech Republic*

VERTICAL JUMP PERFORMANCE IN FEMALE VOLLEYBALL PLAYERS
Soňa Jandová, Miroslav Janura

SPEED ANALYSIS OF THE BREASTROKE PULL-OUT USING SwIMU SYSTEM
Jan Šťastný, Michaela Bátorová, Jaroslav Motyčka

INFLUENCE OF DIFFERENT LOAD OF SCHOOLBAG ON SHAPE AND PRESSURE PARAMETERS OF THE FOOT IN PRIMARY SCHOOL PUPILS
Štefan Balkó, Marek Jelínek, Kateřina Pavlíková, Piotr Gronek

GROUND REACTION FORCES DURING ROLLER SKIING ON THE ASPHALT AND ON THE TREADMILL – CASE STUDY
Martina Chrástková, Soňa Jandová

COMPARATIVE ANALYSIS OF THE KAYAK FORWARD STROKE
Martin Škopek, Radka Bačáková, Kristýna Tunková

DIGITAL LITERACY IN PHYSICAL EDUCATION
Martin Nosek, Štefan Balkó

11:30 – 13:00 Session VI

Purple Hall

Chair: *Zbigniew Borysiuk, Opole University of Technology, Poland*

TO MOVE AND TO BE MOVED – EXPLORING CHILDREN'S OWN MOVEMENT AND INTERACTIONS IN PHYSICAL EDUCATION
Laura Suominen

THE PERSONALITY OF THE PHYSICAL EDUCATION TEACHER: A SCOPING REVIEW
Melina Schnitzius, Alina Kirch, Sarah Spengler, Filip Mess

PRO-SOCIAL AND ANTISOCIAL VALUES IN PHYSICAL EDUCATION: THE VALIDITY AND RELIABILITY OF FAIR PLAY QUESTIONNAIRE IN PHYSICAL EDUCATION (FPQ-PE) – ALBANIAN LANGUAGE
Eridiola Buzi, Juel Jarani, Emanuele Isidori

FINDINGS ON STUDENTS' PERSONALITY IN THE CONTEXT OF PHYSICAL EDUCATION: A SCOPING REVIEW
Alina Kirch, Melina Schnitzius, Sarah Spengler, Filip Mess

FOLK OUTDOOR GAMES IN "HEALTHY CHILD AT SCHOOL AND IN THE FAMILY" PROJECT
Nataliia Beseda

PHYSICAL LITERACY AND ITS ATTRIBUTES FOR LIFELONG LEARNING IN ADOLESCENT POPULATION
Jana Vašíčková

13:00 – 13:15 Closing Ceremony

Red Hall

Contents



KEYNOTE SPEAKERS

ASSESSMENT OF CORE STRENGTH AND POWER UNDER SPORT-SPECIFIC CONDITIONS
Erika Zemková 21

MOVEMENT INTERVENTION AS A TOOL OF THE INFLUENCE OF PHYSICAL FITNESS AND HEALTH
Václav Bunc 22

RUNNING BIOMECHANICS OF ATHLETES WITH HISTORY OF ACHILLES TENDON REPAIR
Daniel Jandačka 23

MARTIAL ARTS IN THE CONTEXT OF HEALTH
Jacek Wąsik 24

SPORT AND HEALTH

DETERMINING GENDER AND DAYS DIFFERENCES IN ADOLESCENT PHYSICAL ACTIVITY LEVELS USING PEDOMETERS IN NORD-WEST BOHEMIA
Ladislav Bláha, David Cihlář 27

PHYSICAL FITNESS AND LEVEL OF BODY COMPONENTS IN THE 11–15 YEAR OLD POPULATION IN WEST SLOVAKIA
Nora Halmová, Janka Kanásová, Ľuboslav Šiška 28

LONGITUDINAL CHANGES IN PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR AND BODY FAT IN CENTRAL EUROPEAN WOMEN: PRELIMINARY FINDINGS
Jana Pelclová, Jana Hodonská , Zuzana Svozilová 29

PRESENT TRENDS OF QUALITY OF LIFE IN UKRAINIAN POPULATION
Iuliia Pavlova 30

TENSEGRITY AND MYOFASCIAL SYSTEM IN SPORT
Eva Buchtelová, Kateřina Tichá 31

WALKING AND BIKING IN THE CONTEXT OF SEDENTARY SOCIETY
Aleš Sekot 32

IMPACT OF BALANCE EXERCISES ON FUNCTIONAL MUSCULAR DISORDERS REMOVAL IN VOLLEYBALL PLAYERS
Janka Kanásová, Natália Czaková, Lenka Divinec, Alexandra Veis, Mária Solvesterová 33

QUALITY OF BALANCE AND PRESSURE DISTRIBUTION OVER THE PRESSURE PLATFORM DURING DOUBLE-LEG STANCE IN YOUNG WOMEN
Pavel Korvas 34

THE ASSOCIATIONS OF PARTICIPATION IN ORGANIZED SPORT AND UNORGANIZED PHYSICAL ACTIVITY IN RELATION TO PHYSICAL ACTIVITY LEVEL AMONG ADOLESCENTS
Pål Lagestad, Camilla Sandvik, Laura Suominen, Idar Lyngstad, Hilde Mikalsen 35

ASSOCIATIONS OF BOUTED SEDENTARY TIME WITH THE PERCEIVED BUILT ENVIRONMENT IN CENTRAL EUROPEAN OLDER ADULTS
Jana Hodonská, Jana Pelclová, Zuzana Svozilová..... 36

WHAT'S IN IT FOR ME? YOUNG TEENAGERS' MEANING-MAKING EXPERIENCES OF MOVEMENT ACTIVITIES
Hilde Mikalsen, Pål Lagestad..... 37

SPORT PERFORMANCE AND TRAINING

CONTRIBUTION TO THE DIAGNOSTICS OF FLOORBALL SKILLS OF FLOORBALL PLAYERS OF YOUNGER SCHOOL AGE
Zuzana Dragounová..... 41

CONCONI TEST – RELIABILITY AND VALIDITY ASPECTS
Jan Hnízdil, Martin Škopek, Štefan Balkó, Martin Nosek, Oto Louka, Martin Musálek Jan Heller 42

SPORT TALENT IDENTIFICATION BASED ON MOTOR TESTS AND GENETIC ANALYSIS
Jaromír Šimonek, Radoslav Židek 43

COMPARING THE QUALITY OF STEREOPSIS IN HANDBALL PLAYERS AND SWIMMERS AT THE AGE OF 5–10 YEARS
Václav Salcman, Jan Blecha..... 44

ANAEROBIC PERFORMANCE IN 30S WINGATE TEST AS ONE OF THE POSSIBLE CRITERIA FOR CHOOSING CZECH HOCKEY PLAYERS INTO NATIONAL HOCKEY LEAGUE
Jan Heller, Pavel Vodička, Michael Janek 45

MATCH CHARACTERISTICS AND RALLY PACE OF MALE TENNIS MATCHES AT THREE GRAND SLAM TOURNAMENTS IN 2017
Jan Carboch, Kristýna Plachá, Michal Sklenářik, Matěj Blau..... 46

IDENTIFICATION OF PREDICTORS IN AGILITY IN BASKETBALL
Pavol Horička, Jaromír Šimonek 47

DIVING REFLEX MONITORING WITH CONNECTION TO FREEDIVING
Oto Louka, Jan Hnízdil, Tereza Louková..... 48

EFFECTS OF PROTEINS ON MUSCLE MASS
Miroslav Petr 49

ASSESSMENT OF THE COORDINATION SKILLS OF GIRLS IN DANCE SPORT
Hana Kabešová, Barbora Šišáková, Jitka Vaněčková 50

THE INTERACTION OF PHYSICAL ACTIVITY, JOY OF MOVEMENT AND QUALITY OF LIVE OF HIGH SCHOOL STUDENTS AT DIFFERENT AGES
Jaroslav Broďáni, Natália Kováčová *51*

BIOMECHANICS OF SPORT

VERTICAL JUMP PERFORMANCE IN FEMALE VOLLEYBALL PLAYERS
Soňa Jandová, Miroslav Janura *55*

ANALYSIS OF THE BREASTROKE PULL-OUT USING SWIMU SYSTEM
Jan Šťastný, Michaela Bátorová, Jaroslav Motyčka *56*

INFLUENCE OF DIFFERENT LOAD OF SCHOOLBAG ON SHAPE AND PRESSURE PARAMETERS OF THE FOOT IN PRIMARY SCHOOL PUPILS
Štefan Balkó, Marek Jelínek, Kateřina Pavlíková, Piotr Gronek *57*

GROUND REACTION FORCES DURING ROLLER SKIING ON THE ASPHALT AND ON THE TREADMILL – CASE STUDY
Martina Chrástková, Soňa Jandová *58*

COMPARATIVE ANALYSIS OF THE KAYAK FORWARD STROKE
Martin Škopek, Radka Bačáková, Kristýna Tunková *59*

CURRENT TRENDS IN PHYSICAL EDUCATION

DIGITAL LITERACY IN PHYSICAL EDUCATION
Martin Nosek, Štefan Balkó *63*

TO MOVE AND TO BE MOVED – EXPLORING CHILDREN'S OWN MOVEMENT AND INTERACTIONS IN PHYSICAL EDUCATION
Laura Suominen *64*

THE PERSONALITY OF THE PHYSICAL EDUCATION TEACHER: A SCOPING REVIEW
Melina Schnitzius, Alina Kirch, Sarah Spengler, Filip Mess *65*

PRO-SOCIAL AND ANTISOCIAL VALUES IN PHYSICAL EDUCATION: THE VALIDITY AND RELIABILITY OF FAIR PLAY QUESTIONNAIRE IN PHYSICAL EDUCATION (FPQ-PE) – ALBANIAN LANGUAGE
Eridiola Buzi, Juel Jarani , Emanuele Isidori *66*

FINDINGS ON STUDENTS' PERSONALITY IN THE CONTEXT OF PHYSICAL EDUCATION: A SCOPING REVIEW
Alina Kirch, Melina Schnitzius, Sarah Spengler, Filip Mess *67*

FOLK OUTDOOR GAMES IN
Nataliia Beseda *68*

PHYSICAL LITERACY AND ITS ATTRIBUTES FOR LIFELONG LEARNING IN ADOLESCENT POPULATION
Jana Vašíčková *69*

POSTER LIST

INFLUENCE OF INCREASE OF SENSOMOTOR TASK DIFFICULTY ON NEURAL SYSTEM AROUSAL AND MOTORIC PERFORMANCE
Daniela Benešová, Karel Švátora *73*

KINEMATIC ANALYSIS OF HIP ANGLE PARAMETERS OF MAE-GERI KICK
Monika Blaszczyszyn, Zbigniew Borysiuk, Agnieszka Szczęsna, Magda Pawlyta, Maciej Marszałek, Dariusz Karczmit *74*

THE FLEXIBILITY OF PUPILS AT SECOND LEVEL OF PRIMARY SCHOOLS
Natália Czaková, Ľubomír Paška, Jaromír Šimonek, Janka Kanásová, Lenka Divinec *75*

USE OF VIRTUAL REALITY IN SPORTS, REHABILITATION AND PHYSICAL EDUCATION
Josef Heidler, Tomáš Edl, Štefan Balkó *76*

THE FEATURES OF PHYSICAL HEALTH INDICATORS AS DETERMINANT OF LIFE QUALITY OF THE PARTICIPANTS IN FIGHTINGS OF UKRAINE
Svitlana Indyka, Nataliia Bielikova, Anatolii Tsos, Olga Andrijchuk, Dorota Ortenburger, Jacek Wąsik ... *77*

THE INFLUENCE OF THE EXPERIMENTAL TEACHING PROGRAMME ON CHANGES IN THE LEVEL OF BASKETBALL SKILLS OF ELEMENTARY SCHOOL PUPILS
Andrea Izáková, Gustáv Argaj, Karel Hůlka, Jaroslava Argajová *78*

THE INFLUENCE OF SPORTS PREPARATION ON THE LEVEL OF AGILITY IN TOP HOCKEY PLAYERS
Jaroslav Krajčovič, Pavol Horička, Ľubomír Paška *79*

SETTING THE CORRECT SITTING POSITION ON THE BICYCLE AS A BASIC PARAMETER EFFICIENT PEDALING
Jan Kresta, Martin Škopek *80*

MOTOR FITNESS IN PREMATURELY BORN CHILDREN AT THE AGE OF 6
Magdalena Lelonek, Monika Zaręba *81*

PHYSICAL ACTIVITY IN FREE TIME IN 6-YEAR-OLD CHILDREN BORN PREMATURELY AND AT DUE TIME
Magdalena Lelonek, Monika Zaręba *82*

LIFE SATISFACTION OF PHYSICAL EDUCATION TEACHERS AGAINST THE SELECTED PROFESSIONAL CONDITIONS AND SOCIO-CULTURAL FACTORS
Paweł F. Nowak *83*

TAPING AS A METHOD OF FLATFOOT CORRECTION IN ATHLETES
Jana Pyšná, Ladislav Pyšný, Dominika Petrů *84*

USE OF KINESIO TAPING IN SELECTED ACUTE AND CHRONIC SPORTS INJURIES
Ladislav Pyšný, Kateřina Fousková, Jana Pyšná, Dominika Petrů *85*

PHYSICAL PERFORMANCE CAPACITY AND FUNCTIONAL STATE OF MEN AND WOMEN SPECIALIZING IN MIDDLE-DISTANCE RUNNING DURING MESOCYCLE
Olha Roda, Svitlana Kalytka *86*

COMPARISON OF AGGRESSION IN THE PERSPECTIVE OF PERFORMANCE MOTIVATION AND SPORT PERFORMANCE AMONG THE FOOTBALL PLAYERS
Miroslava Rošková, Lenka Ďuricová, Beata Žitniaková Gurgová *87*

USE OF THE BRUININKS-OSERETSKY TEST OF MOTOR PROFICIENCY, SECOND EDITION IN SCHOOL PRACTICE
Iva Šeflová, Luděk Kalfiřt, Karolína Indráčková *88*

EFFECTS OF TAURINE AND CAFFEINE PRODUCT ON SIMPLE AND COMPLEX REACTION TIMES
Martin Škopek, Ivo Horák *89*

THE RELATIONSHIP BETWEEN ISOKINETIC HIP ROTATORS TORQUE AND REACTION FORCES DURING FRONT KICK IN TRAINED SOLDIERS
Petr Šťastný, Michal Vágner, Jan Maleček *90*

SLACKLINE AS MEANS OF KINESIOTHERAPEUTIC INTERVENTIONS OF INSTABILITY OF THE KNEE JOINT
Kateřina Tichá, Eva Buchtelová *91*

THE STATE OF PHYSICAL ACTIVITY OF HIGHER INSTITUTION STUDENTS IN UKRAINE
Anatolii Tsos, Vasyl Pantik, Anna Halytska, Juliia Khilchuk *92*

Keynote Speakers



ASSESSMENT OF CORE STRENGTH AND POWER UNDER SPORT-SPECIFIC CONDITIONS

Erika Zemková

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Previous reviews [1, 2, 3] identified gaps in the current standard testing methods used for the assessment of core stability and strength in terms of their low sensitivity in discriminating between individuals of varied ages and performance levels and a lack of specificity to the requirements of particular sports and also in revealing the effect of exercise or rehabilitation programs. In order to partly fill in these gaps, novel testing methods of core strength and power were designed. One of them is a modified deadlift to high pull exercise with free weights or on the Smith machine with stepwise increasing weights up to a maximal power, which the best simulate the demands of sports comprising of lifting tasks. Further is the test adapted from the wood chop exercise that provides conditions similar to those imposed in many sports involving trunk rotations. Such an evaluation of the maximal power and endurance of core muscles during the standing cable wood chop exercise on a weight stack machine is both a reliable method and sensitive to differences among physically active individuals. A suitable alternative represents a system consisting of an inertia measurement unit in a small box inserted on the barbell placed on the shoulders that allows evaluation of power performance during trunk rotations on the dominant and non-dominant side in either seated or standing position. Taking into account the importance of core stability and strength in athlete's performance and probably also in the prediction of injuries, their assessment should be considered an integral part of testing batteries.

Keywords: lifting task, maximum voluntary isometric strength, rotational power, trunk muscles

References:

[1] Zemková, E. (2017). Assessment of power and strength of trunk muscles: from the lab to the field. *Scientific Review of Physical Culture, 7*(4), 103-117.
[2] Zemková, E., Hamar, D., Kienbacher, T., & Ebenbichler, G. (2017). Assessment of core stability and strength: from theory to practical applications. *Slovak Journal of Health Sciences, 8*(2), 64-81.
[3] Zemková, E. (2018). Science and practice of core stability and strength testing. *Physical Activity Review* (In press).

Acknowledgments: This work was supported by the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences (Nos. 1/0373/14 and 1/0824/17) and the Slovak Research and Development Agency under the contract No. APVV-15-0704.

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MOVEMENT INTERVENTION AS A TOOL OF THE INFLUENCE OF PHYSICAL FITNESS AND HEALTH

Václav Bunc

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Purpose: The aim of the study is to summarise the results of the application of appropriate physical activities on physical fitness and health in non-trained Czech population differing in age.

Material & Methods: The energy output on the level 950 to 2000 kcal (3971–8360 kJ) per week was respected by construction of individual moving programs seniors, adults and children of both genders. The moving programs consisted aerobic walking (min 80% of whole exercise) or cycling (min 10 % of total exercise) at the level of 50 to 70 % VO_{2max} (HR ranged from 70 to 90 % of HR_{max} or 130–190 beats·min^{-1}. The duration of exercise session ranged from 20 to 50 min, and training was performed 3–5 times a week. The time spent at exercise per week ranged between 85–250 min.). Exercise training was performed 3–5 times a week during 5 months.
The functional variables were assessed on treadmill by increased load, body composition with help of whole body bioimpedance analysis by using of predicted equations that were adapted for the Czech population.
The followed variables were collected in children (142 boys and 124 girls; mean age 12.6 ± 2.3 years), in both men (n = 154) and women (138) of middle age (45.2 ± 7.0), and in seniors of both gender (men n = 71, women n = 112; 71.6 ± 3.6).

Results: Movement on walk based interventions with an energy content of 2000 kcal in children, 1500 kcal in adults and 950 kcal in seniors can significantly increase of their movement regime (about 30 %), significantly reduce body mass (about 10 %), improve significantly aerobic fitness (about 17 %) and motor performance (about 15 %), reduce the systolic blood pressure (about 7 mmHg) regardless of gender, starting values and age. It is also possible to significantly affect the amount of muscle mass (about 8 %) and thus the assumptions for exercise. If weight reduction and increased fitness are achieved, this may lead to a prolonged life expectancy of about 9 years. In the case of seniors, movement interventions can greatly influence their aging - a functional shift to a lower age of about 5 years.

Conclusion: Reasonable physical activity is a prerequisite for quality lifestyle and active aging. For seniors, a higher level of physical activity and thus increased physical fitness significantly affect the quality and progression of aging – the antiaging effect.

Keywords: energy output, health, physical activity, physical fitness

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RUNNING BIOMECHANICS OF ATHLETES WITH HISTORY OF ACHILLES TENDON REPAIR

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Abstract: The talk will illustrate the evolution of the Achilles tendon in the human species (Homo) and its link with the running. Moreover, the function of the Achilles tendon during running and its most common injuries will be introduced. The incidence of the Achilles tendon rupture will be discussed depending on the type of sport in different countries. The lecture will discuss possible factors which may contribute to increased incidence of the Achilles tendon injuries over the last 30 years. In addition, the consequences of the Achilles tendon rupture and their influence on the running biomechanics will be presented. At the end of the talk we will try to discuss these questions: Do athletes alter their running mechanics and coordination variability after an Achilles tendon rupture? Is barefoot gait appropriate exercise for Athletes with history of AT rupture when they have decreased proprioception? [1, 2, 3, 4 ,5]

Keywords: ankle, evolution, gait, injury risk, kinetics, knee

References:

[1] Jandacka, D., Plesek, J., Skypala, J., Uchytil, J., Silvernail, J. F., & Hamill, J. (2018). Knee Joint Kinematics and Kinetics During Walking and Running After Surgical Achilles Tendon Repair. *Orthopaedic Journal of Sports Medicine, 6*(6), 232596711877986. https://doi.org/10.1177/2325967118779862

[2] Jandacka, D., Silvernail, J. F., Uchytil, J., Zahradnik, D., Farana, R., & Hamill, J. (2017). Do athletes alter their running mechanics after an Achilles tendon rupture? *Journal of Foot and Ankle Research, 10*(1), 53. https://doi.org/10.1186/s13047-017-0235-0

[3] Jandacka, D., Uchytil, J., Zahradník, D., Farana, R., Silvernail, J. F., & Hamill, J. (2015). Barefoot Running With Elongated or Shortened Achilles Tendon After Rupture. In M. Domalain & T. Monnet (Eds.), *33rd International Conference on Biomechanics in Sports* (pp. 383–386). Poitiers, France.

[4] Jandacka, D., Zahradnik, D., Farana, R., Uchytil, J., & Hamill, J. (2016). Footfall patterns of a runner with an Achilles tendon rupture. *Journal of Sport and Health Science*, (May), 1–5. https://doi.org/10.1016/j.jshs.2016.05.004

[5] Jandacka, D., Zahradnik, D., Foldyna, K., & Hamill, J. (2013). Running biomechanics in a long-term monitored recreational athlete with a history of Achilles tendon rupture. *BMJ Case Reports*, 2013. https://doi.org/10.1136/bcr-2012-007370

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MARTIAL ARTS IN THE CONTEXT OF HEALTH

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Abstract: One of the manifestations of physical activity are martial arts. Modern research also concerns the problem of treating martial arts not only as a means of self defence, sport or how one spends their free time, but also as a therapy. Therapy through traditional martial arts can help treat many medical disorders. It was acclaimed that participation in the traditional martial arts promotes mental health. It was noted that the sense of self-worth and self-esteem of competence is directly related to the time spent doing training. Current studies show that the traditional martial arts are largely effective, complementary strategy of medical care and rehabilitation of chronic diseases. By watching yet another MMA event on the TV, seeing players' faces being hit and blood flowing on their bodies, it is worth to be aware that it's just a spectacular event. The everyday life of people concerned with martial arts is different.
Often times they undertake these exercises to improve their physical fitness and the quality of life. It is followed by taking responsibility for their health and not giving it exclusively to the doctor. This results in an active and rational fight agains any disease.

Keywords: health, martial arts, quality of life

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Oral Presentations

Sport and Health



DETERMINING GENDER AND DAYS DIFFERENCES IN ADOLESCENT PHYSICAL ACTIVITY LEVELS USING PEDOMETERS IN NORD-WEST BOHEMIA

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Purpose: Practicing physical activities is connected with cultivation of healthy lifestyle of every individual. For teenagers, we consider them as an input connected with forming and maintenance of life quality. The study strives for establishing indicators of secondary school students' participation in physical activities and evaluate them from recommended criteria and other studies conclusions point of view [1].

Material & Methods: Physical activity was monitored concurrently objectively by the Yamax SW-700 pedometer for seven consecutive days. Pedometers proved themselves in a number of studies and they are appropriate especially for evaluating locomotion physical activities. 358 boys and 330 girls from secondary schools in Ústí nad Labem region went through this investigation. Pedometers were applied in favorable climatic period during common school attendance.

Results: There are average values higher than 10 000 steps a day (M_{min} = 10 111; M_{max} = 10 961), appearing in boys file from each grade of lower-secondary school. Weekend days mean decrease of values (M_{min} = 8 547; M_{max} = 9 761). Average daily values in girls file, according to grades, is on a lower level (M_{min} = 9 247; M_{max} = 10 598). We record the lowest values for girls on weekends (M = 7203.46).

Conclusion: Boys reach higher daily values than girls in all monitored indexes. Values of reached steps, typical for working days, significantly exceed the values typical for weekend days. Median values, characterizing reached steps during weekend days for boys and girls from ninth grade of primary school, reached the lowest levels.

Keywords: healthy lifestyle, monitoring, physical activity, steps

References:

[1] Tudor-Locke, C., Craig, C. L., Beets, M. W., Belton, S., Cardon, G. M., Duncan, S., … Blair, S. N. (2011). How many steps/day are enough? For children and adolescents. *International Journal of Behavioral Nutrition and Physical Activity, 8*(1), 78. http://doi.org/10.1186/1479-5868-8-78

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PHYSICAL FITNESS AND LEVEL OF BODY COMPONENTS IN THE 11–15 YEAR OLD POPULATION IN WEST SLOVAKIA

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Purpose: The aim of the research was to get the knowledge about the physical fitness of current school population in age of 11 to 15 years and to identify the relationship of physical fitness with individual body composition components.

Material & Methods: The data was gained through the bioimpedance diagnostic device In Body 720. For the evaluation of physical fitness, we used the SUUNTO POD. The data were obtained in 4 elementary schools in Nitra region. Research was attended by 562 pupils from 5th to 9th class of primary school. All measurements were carried out under the same conditions from 23–27 April 2018.

Results: In this article we compared the classes with individual schools in terms of gender and within classes we found out the relationships between the physical fitness and selected components of body composition. By the results we found that boys had higher level of physical fitness based on the Ruffier functional test 14.4 ± 4 than girls 15.7 ± 4.2, but this difference was not statistically significant $p > 0.05$. The level of physical fitness has increased, both in boys and girls with increasing age from index 16.1 ± 3.9 to value 14.4 ± 4.1, and these differences were statistically significant $p < 0.05$. Differences between schools in individual classes were statistically insignificant $p > 0.05$. The correlation analysis showed the close relationship of Ruffier index with total body fat parameters and with total body water parameters $p < 0.05$.

Conclusion: The results showed that the physical fitness of the current young population is on low level and we see its decrease to the required index of Ruffier test. These results closely correlate with some body composition components which is reflected in negative tendencies of the physical condition.

Keywords: body components, physical fitness, Ruffier test, SUUNTO POLAR POD

Acknowledgements: The contribution is a part of the grant project: VEGA 1/0410/17 Changes in the level of muscle imbalances, body posture and flexibility in athletes.

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LONGITUDINAL CHANGES IN PHYSICAL ACTIVITY, SEDENTARY BEHAVIOUR AND BODY FAT IN CENTRAL EUROPEAN WOMEN: PRELIMINARY FINDINGS

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Purpose: Older adults are the most sedentary and least active segment of society. Positive associations between obesity and physical activity (PA) were found in cross-sectional studies in older adults. Longitudinal studies might explain the directionality of these associations. Therefore, the aim of this study was to: a) describe longitudinal changes in sedentary behaviour (SB), light-intensity physical activity (LIPA), moderate to vigorous physical activity (MVPA) and percent of body fat (FM%) and b) examine the longitudinal associations between fatness and SB and PA.

Material & Methods: We measured PA and SB by accelerometry and FM% by a bioelectrical impedance method in healthy elderly women (baseline average age of 62.8 ± 3.9 years) at baseline and after a 7-year follow-up. Spearman's correlation coefficients were used to evaluate tracking of physical activity, sedentary behavior and FM% over 7 years.

Results: Mean FM% of the whole sample was 33.8. On average, the women spent 439 ± 68, 351 ± 65 and 42 ± 22 minutes per day in SB, LIPA and MVPA, respectively. Tracking effects of SB, LIPA and MVPA were strong (the correlation coefficients ranging from 0.49 to 0.58) and tracking effects of FM% were even stronger (0.87). Out of 81 women, 34 were obese (42 %) at baseline. After 7 years, SB increased more, but not significantly, in obese women (21.6 % ± 19.1 %) than in nonobese women (17.5 % ± 12 %). 7-year changes in MVPA show high variability. On average, MVPA decreased more, but not significantly, in obese women (-10.4 ± 55.1 %) than in nonobese women (-6.2 ± 52.9).

Conclusion: We provide evidence of tracking of SB, PA and FM% in older age in women. However, these findings are preliminary and further study with larger sample size is needed to confirm them.

Keywords: accelerometer, longitudinal study, older women, physical activity, sedentary behaviour

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PRESENT TRENDS OF QUALITY OF LIFE IN UKRAINIAN POPULATION

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Purpose: of the study was to analyze the health-related quality of life of different age groups of the Ukrainian population and evaluate their ability to manage with everyday tasks and participate in different society activities

Material & Methods: This study included 3 347 persons, aged 15–80 years. Obtained results were divided into four age groups and compared with appropriate age groups from different countries. The evaluation of health-related quality of life was conducted with the SF-36 survey. Respondents were asked to answer questions referring to the last 4 weeks. Summed raw scores were transformed to 0–100 scale. Physical component of quality of life includes the results of Physical Functioning Scale, Role Limitations due to Physical Problems Scale, General Health Scale, and Bodily Pain Scale; Vitality Scale, Social Functioning Scale, Role Limitation due to Emotional Problems Scale, Mental Health Scale were included to Mental Component.

Results: The quality of life of Ukrainians of different ages was average or lower than the average level. Critical for adolescents (less than 70 points) were values of General Health Scale, Vitality Scale, Role Emotional Problem Scale, and Mental Health Scale. Quality of life significantly reduced during adulthood on the Physical Functioning Scale, Role Physical Problems Scale, Bodily Pain Scale, Role Emotional Problem Scale. The lowest for the elderly people were life quality according to Role Emotional Scale (44.0 points), General Health Scale (51.4 points), Bodily Pain Scale (52.2 points); the indexes of the Mental Health Scale, Social Activity Scale, and Vitality Scale in the range from 55.6 to 60.4 points. The value of Mental Health Scale for elderly people did not differ from adolescents and adults ($p < 0.01$); there was not any statistically significant difference between the Role Physical Problem Scale, Bodily Pain Scale, Vitality Scale, Role Emotional Problem Scale for adults and elderly people ($p < 0.01$).

Conclusion: Ukrainian population has one of the lowest health-related quality of life compared to the results of persons suffering from chronic or acute diseases from other countries. Obtained data proved limitations of daily activities and indicated problems with the functional state.

Keywords: health, quality of life, Ukrainian population

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TENSEGRITY AND MYOFASCIAL SYSTEM IN SPORT

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Purpose: Tensegrita is a term consisting of English words for tension and integrity. These terms represent the two main directions of magical movements. Their active component is tension resulting from the contraction and relaxation of the muscles and tendons. The passive component is integrity, because throughout the exercise the body is seen as a healthy, complete and perfect unit. An example of tensegrity is the deep stabilization system of the trunk and spine = the muscles involved in keeping the trunk in an upright position and during all activities in walking, running, standing and sitting. The function of the deep stabilization system is to keep accurate position of the head, spine, its joints and pelvis to one another. The activation of the muscles of the deep stabilization system is automatic and thus it performs a protective function against the load on the structure of the trunk and spine. The aim of this report is to demonstrate the effect of stretching exercises on the quality of the deep stabilization system in top-level athletes aged 16 to 30.

Material & Methods: The study was attended by 10 top-level athletes aged between 16 and 30 (ice hockey, aerobics, volleyball, basketball). In this study, a two-month intervention (compensation) program, was applied to athletes. Athletes trained every day for 15 minutes. In order to evaluate the effect of the intervention, the Kolar stabilization tests were used (flexion test, intra-abdominal pressure and diaphragm test).

Results: Based on the results of our work, we concluded that a two-month compensation program can affect body posture and condition of the core muscles. Overall test scores show a statistically significant improvement in these tests.

Conclusion: The results of this study suggest that for rehabilitation practice with top-level athletes, the minimum duration of the intervention program should be longer than 8 weeks. They also show how important co-operation of a trainer with a physiotherapist is, and, in a better case (which is a necessity for professional clubs), as well as with a rehabilitation doctor.

Keywords: deep stabilization system, physiotherapy, tensegrity

References:

[1] Kolář, P. (2009). *Rehabilitace v klinické praxi*. Praha, Czechia: Galén.
[2] Larsen, C. H., & Rosmann-Reif, K. (2012). *Skolióza - jak pomáhá pohyb: Nejlepší cviky konceptu Spiraldynamik pro nové vnímání těla*. Olomouc, Czechia: Václav Lukeš.
[3] Nisand, M., & Geismar, S. (2005). *Metoda La Mezieres: revoluční koncept*. (J. Lyon, Ed.). France.

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WALKING AND BIKING IN THE CONTEXT OF SEDENTARY SOCIETY

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Purpose: Discussing the position and the nature of contemporary sport means to say: Sport is the same as the society. Physical activity in terms of motives, forms of intensity changes considerably, in particular in the context of the phenomenon of post-modern sedentary society. From the perspective of leisure sport activities public health recommendations for physical activity tend to emphasize particularly walking and bicycle riding. Active transport is considered an important source of natural physical activity in all stages of life. The paper illustrates walking and biking as an agent for aquiring invigorating affects of regular, high-quality and life-long physical activities on health, fitness and morals: for wellness.

Material & Methods: Presented data ilustrate the results of larger survey of participation of adult Czech population in physical activities, including walking and cycling.

Results: Survey confirmed general decline in proportion of sport and excercise in leisure time, decreasing importance of walking and cycling as means of transport, higher participation in sport in men, increasing relative proportion of walking in age and increasing popularity of nordic walking.

Conclusion: On the whole it is confirmed that overal climate of sedentary society in which sport is more of a passively consumed as a form of mass entertainment rather than an actual acvtivity practised as an integral part of people´s life style on permanent lifelong basis.

Keywords: active transport, biking, physical activity, sedentary society, walking

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IMPACT OF BALANCE EXERCISES ON FUNCTIONAL MUSCULAR DISORDERS REMOVAL IN VOLLEYBALL PLAYERS

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Purpose: The research was aimed at obtaining and widening the findings of the functional state of the musculoskeletal system of the research sample of volleyball players, and also the possibilities of influencing of balance exercises in the sports training of athletes.

Material & Methods: The object of the study were 12 female players of the junior volleyball team VKM Stará Ľubovňa, playing the Slovak Championship – Eastern division. The junior volleyball team VKM Stará Ľubovňa with an average decimal age of 15.76 years was observed within the time interval of three months. In the timeframe, initial and final measurements were made. To investigate the function of muscle disorders in terms of shortened muscles, muscle weakness and disturbed movement patterns the evaluation method of [1], modified for the purpose of physical education and sports practice by [2] was used. The methodology was described and followed according to [3].

Results: The entry measuring of the players found a high percentage of functional muscle disorders and the most risky muscles and muscle groups that tend to shorten and weaken in subjects. On the basis, a targeted compensation program of balancing exercises was developed. A significant decrease of the incidence of measured functional muscle disorders to $p < 0.01$ of shortened knee flectors, musculus rectus femoris, of weakened abductors of hip joint, deep flexors, lower fixators of spatulas and broken motor stereotypes – one leg stand and push up was observed after the inclusion of experimental factor into training plans actively for a three-month period. On the significance level $p < 0.05$ decrease of shortened musculus triceps surae, musculus quadratus lumborum a musculus iliopsoas, of weakened abdominal muscles and of sitting down stereotype was registered.

Conclusion: Of the acquired statistical data, significant conclusions may be drawn: the inclusion of appropriate and regular balance exercises in the training process of young athletes has a positive impact on reducing or eliminating muscle functional disorders of the musculoskeletal system in its individual components - shortened muscles, weakened muscles and impaired movement patterns.

Keywords: balance exercises, functional muscular disorders, impaired movement patterns, shortened muscles, weakened muscles

References:

[1] Janda, V. (1982). *Základy kliniky funkčních (neparetických) hybných poruch*. Brno, Czechia: Ústav pro další vzdělávání středních zdravotnických pracovníků.

[2] Thurzová, E. (1992). Svalová nerovnováha. In J. Labudová & E. Thurzová (Eds.), *Teória a didaktika telesnej výchovy oslabených (vybrané kapitoly)* (pp. 7–46). Bratislava, Slovakia: FTVŠ UK.

[3] Kanásová, J. (2005). *Svalová nerovnováha u 10 až 12 - ročných žiakov a jej ovplyvnenie v rámci školskej telesnej výchovy*. Bratislava, Slovakia: PEEM.

Acknowledgements: The contribution is a part of the grant project: VEGA 1/0410/17 Changes in the level of muscle imbalances, body posture and flexibility in athletes.

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QUALITY OF BALANCE AND PRESSURE DISTRIBUTION OVER THE PRESSURE PLATFORM DURING DOUBLE-LEG STANCE IN YOUNG WOMEN

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Purpose: The objectives of the study are to determine the effect of foot pressure distribution over the pressure platform on the balance and to compare the results of balance tests in active and inactive women.

Material & Methods: Subjects of our study were two groups of healthy young women. Group A: physically active women (n = 28, 21.5 years, physical activity 8.8 hour/week), group B: physically inactive (n = 28, 22 years, physical activity 1.3 hour/week). Three balance test we carried out: double-leg stance: eyes open (EO) and closed (EC) for 30 s, one-leg stance (R and L) for 10 s. Pressure walkway (FDM system, fi. Zebris) was used for data collection.
Parameters: COP_v: velocity of centre of pressure (mm/s), VGRF: vertical ground reaction forces under sole of the foot.

Results: We found out that a physically active group of young women have significantly better results in all balance tests ($p \leq 0.05$). Both groups showed a similar tendency for significant deterioration of the results when limiting the support surface or limiting the visual sensor relative to the basic OE test.
The differences in the distribution of pressures under the feet between the groups were significant in both the mediolateral (M-L) and anteroposterior (A-P) directions. Active women showed a balanced stance in the M-L and the A-P direction, with a slight tendency to increase the loading on the front part of foot. Inactive women more significantly loaded the non-preferred leg and the rear part of the foot.

Conclusion: It was confirmed that the group B has a significantly worse characteristics of balance than physically active peers. The foot load strategy was less favourable for the group B; during EO, they load more one foot and the rear part of the foot.

Keywords: balance, physical activity, test, vertical ground reaction force, young women

Acknowledgments: This study was supported by grants "Institutional developing project" (RP 90518010) of Brno University of Technology.

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THE ASSOCIATIONS OF PARTICIPATION IN ORGANIZED SPORT AND UNORGANIZED PHYSICAL ACTIVITY IN RELATION TO PHYSICAL ACTIVITY LEVEL AMONG ADOLESCENTS

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Purpose: Physical activity is positively associated with adolescents' health, but a major concern is that many adolescents do not fulfil the recommendations of physical activity. The study examine the associations of organized sport and unorganized physical activity, in relation to physical activity level among adolescents.

Material & Methods: 304 Norwegian adolescents (12–13 years of age) wore accelerometers for one week according to international standards, and reported their participation in organized sport an unorganized physical activity in a questionnaire.

Results: The results showed that the level of participation in organized sport was positively associated with the adolescents' activity level, while there was no significant association between time spent in unorganized physical activity, and adolescents daily minutes of moderate and vigorous physical activity. Boys that participate less than 3 hours a week (or not at all) in organized sport, stood out with the lowest fulfillment of the health recommendations of physical activity.

Conclusion: Our findings support previous research pointing to the importance of getting adolescence to participate in organized sport, and not drop out from sport during adolescence.

Keywords: adolescence, organized sport, physical activity level, unorganized physical activity

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ASSOCIATIONS OF BOUTED SEDENTARY TIME WITH THE PERCEIVED BUILT ENVIRONMENT IN CENTRAL EUROPEAN OLDER ADULTS

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Purpose: Sitting has become the dominant posture during most activities of daily living across the life course. Due to negative effect of sedentary behaviour (SB) on human health, it is crutial to understand the different determinants. The attributes of the built environment are associated with physical activity, but less is known about its influence on SB. There is lack of valid information about accumulation of SB in older adults and how their neighbourhood could influence it. The aim of this investigation was to examine the associations of accelerometry monitored SB with attributes of built environment in older adults from Central Europe.

Material & Methods: We investigated the association between objectively measured SB and the attributes of perceived built environment assessed using the Abbreviated Neighbourhood Environment Walkability Scale (ANEWS). SB was monitored using an accelerometer set at 1 min epoch. All participants wore the device for seven consecutive days at least 10 hours per day. The following categories of sedentary bouts were exported and analyzed: 1–4, 5–9, 10–19, 20–29, 30–39, 40–59 and 60+ min. We performed a logistic regression and a multiple linear regression analysis that was adjusted for confounding variables.

Results: 506 community-dwelling older adults (average age of 68.3 ± 5.8 years) from three Central European countries were included in this analysis. On average, the participants spent 472 ± 83, 317 ± 78 and 38 ± 24 min per day in SB, light-intensity PA and MVPA, respectively. In fully adjusted models, land use mix accessibility and infrastructure for walking/cycling were significantly negatively associated with sitting time accumulated in bouts ≥ 60 min, and positively associated in bouts 1–20 min at the same time. Traffic and crime safety was negatively associated with all lengths of sedentary bouts. Residential density and neighbourhood aesthetics did not show any association with SB.

Conclusion: These findings demonstrate that neighbourhood environment is associated with SB in older adults. It could be valuable targets of future interventions and for land-use planning.

Keywords: accelerometry, ANEWS, built environment, older adults, sedentary behaviour

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WHAT'S IN IT FOR ME? YOUNG TEENAGERS' MEANING-MAKING EXPERIENCES OF MOVEMENT ACTIVITIES

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Purpose: The aim of this article is to shed light on the lifeworld of thirteen-year-olds with high and low activity levels in relation to movement activities. Insights on this topic could serve as important resources for all those who contribute to the development and life quality of young teenagers through various contexts involving movement activities.

Material & Methods: The empirical material is based on individual interviews with four young teenagers, two characterized by a high, and two by a low physical activity level. The analysis process has been carried out in accordance with the interpretative phenomenological analysis method.

Results: The study uncovered both unique and parallel meaning-making dimensions among the participants, but a pattern of several dissimilarities distinguished the highly active from those with low activity. Among those with high activity "finding oneself in the activity", "to be better", "interplay" and "self-regulation" were identified as meaning-making dimensions. Among those with low activity "ambivalence", "to be good", "interplay" and "self-regulation" were identified as meaning-making dimensions. Meaning-making in terms of interplay and self-regulation expressed a partly polarized picture of the lifeworld of young people with high and low activity levels in relation to movement activities.

Conclusion: The identified meaning-making dimensions have been interpreted and discussed in accordance to physical literacy [1], as an expression of individual stances in a journey of bodily formation. In light of this perspective, the importance of gaining experience with a wide range of activities in different activity contexts, in addition to experiencing self-confirming and competent interplay with the surroundings, are highlighted as important meaning-making dimensions in a positive and confirming relationship to movement activities.

Keywords: meaning making experiences, movement activity, physical literacy, youths

References:

[1] Whitehead, M. (2010). *Physical Literacy: Throughout the Lifecourse*. London, UK: Routledge.

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Oral Presentations

Sport performance and training



CONTRIBUTION TO THE DIAGNOSTICS OF FLOORBALL SKILLS OF FLOORBALL PLAYERS OF YOUNGER SCHOOL AGE

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Purpose: The purpose of the study was to design a standardized diagnostic tool, a rating scale designed to diagnose floorball skills in young school–age children. The scale can predict the level of tested floorball skills that is necessary for future game performance.

Material & Methods: For the construction of the Guttman–type assessment scale, the item response theory was applied, namely Rasch's model. The methodology employed the technique of the construction of a "perfect scale for motor skills diagnostics" developed by Cepicka [1,2]; recommended procedures for standardization of motor tests by authors Stochl & Musalek [3]; expert analysis for content validity assessment according to Lawshe; fit functions to determine the fit of the data model; KR – 20 coefficient for the reliability calculation; Fleiss' kappa coefficient for determining the agreement between the raters and the principal component analysis of residuals to determine the unidimensionality of the scale.

Results: Only 9 items out of a total of 30 items were selected and retained in the developed rating scale designed to diagnose the floorball skills in young school–age children. However the scientific standardization procedure of the final nine items rating scale has been successful. The Rasch model fit the data well and all three criteria of unidimensionality were met. The reliability value of the rating scale was 0.81 and the inter–rater agreement (Fleiss kappa) reached 98.5 %.

Conclusion: The developed rating scale is intended for floorball coaches to assess the level of the acquired floorball technique, which determines the ability to play floorball game. The process of the designing of the scale should be also beneficial for the design of motor tests in other sports specialties and sport science. The developed rating scale includes 9 items suited to assess ball handling and ball controlling techniques and passing techniques. Unfortunately, items containing shooting were not selected. The items were too difficult and they misfit the Rasch model.

Keywords: floorball, Guttman scale, item response theory, Rasch model, standardization

References:

[1] Čepička, L. (2003). Konstrukce perfektní škály v diagnostice motorických dovedností. *Česká Kinantropologie*, *7*(1), 7–18.
[2] Čepička, L. (2005). *Příspěvek k unidimenzionálnímu škálování motorických předpokladů* (Habilitační práce). Univerzita Karlova, Praha, Czechia.
[3] Štochl, J., & Musálek, M. (2009). A practical guide to pilot standardization of tests. *Acta Universitatis Carolinae Kinanthropologicae*, *45*(2), 5–15.

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CONCONI TEST – RELIABILITY AND VALIDITY ASPECTS

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Purpose: The Conconi test (CT) is an incremental exercise test characterized by stages of equal intensity. For analysis speed (S) and HR (heart rate) are used. The deflection point of the HR/S graph marks the point where the linear relation between S and HR changes to a curvilinear one. As Conconi stated HR at deflection point represents anaerobic threshold (ANT) value. Purpose of this study was to extend our previous research dealing with reliability and validity of CT.

Material & Methods: During 10 years (2007–2017) we tested 2 500 subjects using Conconi protocol. Tested were mainly football players and smaller number of runners (long distance and cross country) different ages and fitness level. Some subjects were tested repeatedly during the years. Initial speed of the running treadmill test was determined in the range of 10 to 12 $km \cdot h^{-1}$, according subjects age and fitness level. Speed was increased gradually every 150 m of 0.5 $km \cdot h^{-1}$ to the maximum speed when further increases were impossible. HR was recorded at every 150 meters. From a graphical representation dependence HR on increasing running speed we tried to find apparent diversion from the curve of linearity, labeled by Conconi as "deflection point" (DP). Simultaneously respiration values were recorded. From these respiration data we determined the ventilatory threshold (VT_2) as a metabolic marker of the onset of blood lactate accumulation.

Results: We found 6 types of response HR to increasing speed. a) regular DP b) linear regression $r \geq 0.98$ – no DP c) linear regression $r < 0.98$ – no DP d) inversion character of deflection point e) DP not corresponding with value of ANP f) more than one DP.
In more than 30 % of cases DP not occurs at repeated measures at same subjects during the years. As an ANT predictor compared with VT_2, Conconi test overestimated this value (0.5 $km \cdot h^{-1}$)

Conclusion: Using of Conconi test as a predictor of ANP has a limitation. 1) ANP values determined by CT are overestimated (0.5 $km \cdot h^{-1}$). Test stability of CT is very low and there is evidence that DP is not repeated physiology phenomena.

Keywords: anaerobic threshold, Conconi test

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SPORT TALENT IDENTIFICATION BASED ON MOTOR TESTS AND GENETIC ANALYSIS

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Purpose: Physical tests have long been used for determining a child´s athletic abilities before age 9. At that age children are not yet physically mature and their motor skills are being developed. That is why the genetic test can come in [handy] for looking for early indicators of talent in performance areas.

Material & Methods: The research sample included 169 pupils (97 male; mean age = 7.438 y. and 72 female; mean age = 7.227 y.) attending 3 elementary schools within the region of Nitra town, Slovakia. All pupils underwent 9 physical tests to determine their general physical abilities. Each performance of pupils in tests was allotted points. Followingly, 30 pupils ranked best were selected to undergo 2 ml saliva sampling (GeneFix Saliva Collectors) for genetic analysis. Samples were analysed using the apparatus HiScan (Illumina inc, San Diego, USA), which allowed for analysing 400 000 polymorphisms in a human gene. The values of individual genetic score are compared with histogram of genetic score distribution in European population. Software Genomestudio (Illumina inc, San Diego, USA) and software TANAGRA 1.4.50 were used for data analysis.

Results: Based on the analysis we offered parents and coaches valid information about their children´s prerequisites for certain group of sports, type of muscle fibre, oxidative capacity, nutrition type, regeneration, injury prevention, injury susceptibility, etc.

Keywords: 7-year-old pupils, genetic analysis, motor tests, prerequisites for sport, sport talent identification

Acknowledgement: This study was supported by a research grant VEGA 1/0027/17 “Possibilities of genetic testing upon identifying sport talent” and allowed 30 parents to obtain free genetic analysis of their children´s prerequisites for certain type of sport activity.

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COMPARING THE QUALITY OF STEREOPSIS IN HANDBALL PLAYERS AND SWIMMERS AT THE AGE OF 5–10 YEARS

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Purpose: Motion Prerequisites in Children of younger School Age in the Czech Republic and Spain [1]; Erforschung von Synergien der Sehfunktionen und der menschlichen äußeren Bewegungsausdrücke [2]; The influence of binocular vision on sensomotor learning process [3]; The aim of this study is to assess the quality of stereoscopic vision in children of younger school age with regard to sports activities (handball, swimming), regularly performed by these children. Hypothesis: The quality of stereoscopic vision in handball players at the age of 5–10 years is higher than in swimmers of the same age.

Material & Methods: The research sample consisted of 60 probands (boys and girls, age range of 5–10 years). In order to determine the level of stereopsis, the standardized test "Titmus stereo test" was used. At the same time, the initial history of sports-physical activities was carried. For the statistical processing, the non-parametric method – Mann-Whitney U test – was used. Other parameters were expressed by means of frequency, averages, and percentage representation in charts.

Results: The observed data support our hypothesis that physical activity connected with a strong activation of visual and brain functions could affect the quality of individual elements of visual space depth perception, such as stereopsis or myopia. The median values of stereoscopic vision levels (max 10) in handball players (9) and swimmers (7) are demonstrably given in favour of handball players. On the basis of the statistical results ($Z = -1.97$; $p = 0.05$), we can accept the determined hypothesis validated by the "Titmus stereo test" test of stereopsis, and we can state that the quality of stereopsis in handball players is higher than in swimmers.

Conclusion: Based on the data ascertained, it can be presumed that the physical activity requiring strong activation of visual and brain functions can affect the quality of the individual components of visual perception of space, such as stereopsis or myopia. This factor should not be underestimated and physical activity of children and adults, no matter whether recreational or sports-oriented, should contain the dynamic motion elements. This project was financed by the University of West Bohemia, Faculty of Education (Project SGS-2016-035).

Keywords: handball, stereopsis, stereopsis test, swimming, younger school age

References:

[1] Salcman, V., Benešová, D., Valach, P., & Pařízek, L. (2017). Motion Prerequisites in Children of younger School Age in the Czech Republic and Spain. In *ICERI2017, 10th Annual International Conference on Education, Research and Innovation* (pp. 4948–4955). Seville, Spain.

[2] Salcman, V. (2015). Erforschung von Synergien der Sehfunktionen und der menschlichen äußeren Bewegungsausdrücke. Chemnitz, Germany: GUC-Verlag.

[3] Salcman, V., Benešová, D., Valach, P., & Hecová, L. (2015). The influence of binocular vision on sensomotor learning process. In *INTED 2015: 9th International Technology, Education and Development Conference*. Madrid, Spain: IATED Academy.

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ANAEROBIC PERFORMANCE IN 30S WINGATE TEST AS ONE OF THE POSSIBLE CRITERIA FOR CHOOSING CZECH HOCKEY PLAYERS INTO NATIONAL HOCKEY LEAGUE

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Purpose: The selection into the National Hockey League (NHL) is based on criteria reflecting job analysis of a professional ice hockey player and the requirements of the game. Only few Czech elite ice hockey players succeed to participate in NHL, and the aim of the study was find out and evaluate the level of anaerobic readiness of Czech hockey forwards and defenders playing in the NHL.

Material & Methods: Results of 30 s Wingate anaerobic test obtained in 26 forwards and 16 defenders, Czech hockey players from the NHL (from 2001/2002 to 2015/2016 seasons) were compared with the reference values for elite Czech ice hockey players [1]. The comparison was based on the mean values, rate of dispersion, and effect sizes were calculated using Cohen's *d* coefficient.

Results: In forwards, the both absolute and relative values of peak power (PP) and anaerobic capacity (AnC) found in Czech players in NHL were higher ($d > 1$) than in elite Czech national players. In defenders, only the value of AnC relative to body mass showed small effect ($d = 0.36$), but absolute and relative values of PP and absolute value of AnC were higher ($d > 1$) than in elite Czech national players.

Conclusion: The results of the study indicate that anaerobic readiness evaluated by 30 s Wingate test may be, besides dominant on-ice skills, one from the criteria of entry to the top ice hockey competition.

Keywords: anaerobic, National Hockey League, Professional ice hockey players, Wingate test

References:

[1] Heller, J., & Vodička, P. (2014). Anaerobic performance capacity in Czech ice hockey players: A comparison of the results in forwards, defenders and goalkeepers aged 15 to 35 years. In L. Flemr (Ed.), *Physical Activity in Science and Practice* (pp. 149–157). Prague, Czechia: Karolinum.

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MATCH CHARACTERISTICS AND RALLY PACE OF MALE TENNIS MATCHES AT THREE GRAND SLAM TOURNAMENTS IN 2017

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Purpose: Tennis is played on different surfaces (fast, medium, slow) which affect the matches characteristics and strategy. Players hit very fast shots during matches and the surface can affect the time which an opponent has to hit the ball back. The aim is to analyse the rally pace characteristics and the frequency of rally shots in the men's matches at the Australian Open, French Open and Wimbledon.

Material & Methods: We analysed male matches at three Grand Slam tournaments in 2017 (Australian Open, French Open and Wimbledon). We compared a point duration, number of rally shots, time between the points, rally pace (duration of the ball delivery from the opponent, in other words how much time the player has to hit the ball after the opponent's stroke) and work/rest ratio.

Results: The rally pace was the fastest at Australian Open 1.22 ± 0.03 s, then at Wimbledon 1.27 ± 0.09 s and the slowest at the French Open 1.34 ± 0.19 s. The work/rest ratio was 1:3.37 – 1:3.73. The time between points was the shortest at Wimbledon 18.80 ± 1.49 s and the longest at the French Open 22.59 ± 2.14 s. Players reached the longest point duration (6.87 ± 1.34 s) and the biggest mean rally shot number (5.14 ± 0.88) at the French Open. At the French Open, 53 % of points were finished within the first four shots of the rally; 59 % at the Australian Open; and 66 % at Wimbledon.

Conclusion: These findings can be used by coaches to utilize the practice sessions prior the Grand Slam tournaments to help adopt useful strategies.

Keywords: performance analyses, physiology, tennis, training, strategy

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IDENTIFICATION OF PREDICTORS IN AGILITY IN BASKETBALL

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Purpose: The aim of this study was to determine the relationship between individual kinds of agility (Illinois test, Fitro agility check, Y-test), reaction and acceleration speed (modified test – 10 m run) and running speed (30 m run), space orientation (shuttle run) in order to identify the best predictor(s) of agility. For this purpose we observed 12 players (n = 12) of the top basketball team of BKM UKF Nitra.

Material & Methods: Agility scores were obtained using Fitro agility check, time data were measured using the Witty electronic timer and the Witty Sem traffic light. The level of cognitive abilities was determined using the Stroop test.
To evaluate the relationships of all variables with three types of agility (Illinois test, Y agility test, Fitro agility test) and other indicators Pearson correlation and multiple regression analysis were used.

Results: There was found a significant correlation in the case of simple running agility (Illinois) with all observed motor abilities (3 m, 10 m, 30 m) but also with a simple reaction agility (Y test; rs = 0.776). This was also limited by the space orientation (shuttle run; rs = 0.758). The complex reaction agility (FAC) in the observed group correlated exclusively with cognitive abilities (Stroop test; rs = 0.752).

Conclusion: We came to the conclusion that the share of motor predictors of agility decreases with the complexity of agility performance. On the other hand, the share of mental cognitive processes on influencing the quality of agility performance increases.

Keywords: agility, basketball, cognition, sports preparation

Acknowledgement: The contribution is based on support of the grant task of the MŠ VŠŠ VEGA no. 1/0454/16 - "Complex movement ability agility and their possibilities of its development in selected sports".

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DIVING REFLEX MONITORING WITH CONNECTION TO FREEDIVING

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Purpose: The aim of this study was to find changes in selected physiological parameters, associated with diving reflex with connection to freediving.

Material & Methods: Twenty health men (average age 26.51, SD = 1.32) participated in the research. Men were tested with using special tests, and physiological changes in heart rate, blood pressure and oxygen saturation were recorded using with standard instruments. Three tests were performed. TEST 1 – Holding breath without immersing the face. TEST 2 – Face immersion without breathing. TEST 3 – Face immersion with a holding breath. The data obtained was then evaluated and processed.

Results: We found that diving reflex significantly changes the selected physiological values. Heart rate and oxygen saturation decreases and blood pressure increases.

Conclusion: Implications of the results is in area of freediving. It helps better understanding of body reaction to extreme load in water environment.

Keywords: diving reflex, freediving, physiological changes

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EFFECTS OF PROTEINS ON MUSCLE MASS

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Purpose: Aim of this communication is to review literature focused on effects of protein ingestion following exercise.

Material & Methods: The presentation is a short review of current knowledge about the effect of dietary proteins on muscle synthesis following a resistance exercise. Type of the work is a literature review.

Results: Vast majority of studies confirms the effects of dietary protein on muscle protein synthesis (MPS) following the resistance exercise. Although, many aspects should be taken in consideration such as protein dosage, type, and time of ingestion. In addition, the age of individuals or type of exercise seems to be important too. These and some other related issues will be discussed during the presentation.

Conclusion: Proteins (as food or supplements) seems to be effective way to stimulate muscle protein synthesis after an exercise.

Keywords: exercise, MBP, MPS, proteins, protein synthesis

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ASSESSMENT OF THE COORDINATION SKILLS OF GIRLS IN DANCE SPORT

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Purpose: Obsolete approaches require modernization and subsequent acceptance of new dance trends, including modern practices and innovations [1,2,3]. The aim of the work is to verify whether dance program will lead to development musical-movement abilities in dancers in the senior category. Dancers with six weeks of dance program will achieve substantial improvements in musical-movement tests ability.

Material & Methods: For testing were selected women attending the Fénix Dance School in Louny and engaged in ball formation. In the evaluation was used a standardised test battery, which include eight tests with music motion focus. Total 20 women has been tested, they were divided into experimental and control group.

Results: We found a significant difference in all tests. The rhythmic perception test ($p = 0.78$; $r = 0.07$) and the rhythmic adaptability test ($p = 0.48$; $r = 0.17$) is demonstrated without significant difference. Significant differences in the motor-memory test ($p = 0.33$; $r = 0.22$), the motor memory and learning test ($p = 0.12$; $r = 0.35$) regulation and coordination ($p = 0.39$; $r = 0.20$) and even in the dynamic equilibrium test ($p = 0.53$; $r = 0.15$). The following two tests for motion improvisation testing ($p = 0.18$; $r = 0.31$) and motion creativity ($p = 0.31$; $r = 0.23$) are followed without any significant difference.

Conclusion: Senior dancers who have completed a six-week dance program have achieved substantial improvements in musical-movement abilities tests.

Keywords: coordination skills, dance program, dance skills

References:

[1] Brtníková, M. (2008). *Modernizace hudebně pohybové výchovy*. Praha, Czechia: Univerzita Karlova.
[2] Frömel, K., Stratton, G., & Vašendová, J. (2002). Dance as a Fitness Activity. The Impact of Teaching Style and Dance Form. *Journal of Physical Education, Recreation and Dance*, *73*(5), 26–30.
[3] Zajacová, K. (2013). *Hodnocení koordinačních schopností se zaměřením na tanec u dívek středních škol* (Diplomová práce). Univerzita Jana Evangelisty Purkyně, Ústí nad Labem, Czechia.

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THE INTERACTION OF PHYSICAL ACTIVITY, JOY OF MOVEMENT AND QUALITY OF LIVE OF HIGH SCHOOL STUDENTS AT DIFFERENT AGES

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Purpose: The paper presents the results of the interaction analysis between physical activity (PA), joy of movement (PACES) and areas of quality of life (SQUALA) of high school students with different levels of sport performance and different ages. These factors have wider background. Phenomenon of the subjective assessment "PACES" is stepping to the foreground. "PACES" proves high frequency of interactions with the areas of SQUALA, more than a single volume of PA [1,2]. Despite of enough PA in week and high level of PACES, no expected interactions with areas of SQUALA in high school students were demonstrated [3,4]. The low number of positive interactions points to the necessity of monitoring this construct, also in the relation to gender, to different sports level, type of school, region, country and age [5].

Material & Methods: The survey was attended by 16–19 years old (n = 1302) high school students. The quality of life was examined through SQUALA questionnaire, enjoyment of physical activities by the PACES questionnaire and the level of physical activity in hours per week (PAQ) and by sport level. The data are presented by the descriptive characteristics of the (n, M, SD) and statistical significance of the differences, respectively the interactions were evaluated by nonparametric methods (W, U, r_s).

Results: The interactions between PA, PACES and SQUALA in high school students with different sports level with different ages have been proven very sporadically. Positive correlations of PA with areas of SQUALA prevails in 18 and 19 years old students. The joy of movement correlates with spiritual well-being in groups of students who carry out the physical activities occasionally and regularly. Positive interactions of joy of movement with physical well-being have not been proven. Negative interactions between the PA, PACES and SQUALA prevails between 16 and 17 years old students.

Conclusion: The higher age factor and factor of the regular movement in high school students appears to be very important in this study. The results reaffirm the importance of voluntary and organized physical activities which have potential to raise the level of the joy from the movement in life of high school students. The paper was published with founds from grant KEGA 003UKF-4/2016.

Keywords: joy of movement, physical activity, quality of life

References:

[1] Broďáni, J., & Paška, Ľ. (2014). The quality of life of adolescents in relation to preferred type of sport. In P. Schickhofer (Ed.), *Sports, physical activity and health - International scientific conference* (pp. 65–75). Bratislava, Slovakia: Slovak Scientific Society for Physical Education and Sports.

[2] Broďáni, J., Spišiak, J., & Paška, Ľ. (2015). The interaction of physical activity and quality of life of adolescents. *Journal of Physical Education and Sport*, *15*(3), 518–524.

[3] Broďáni, J., Lipárová, S., & Kráľ, M. (2016). The interaction of physical activity and the life quality of students in mid and late adolescence. *Physical Activity Review*, *4*(1), 124–131.

[4] Broďáni, J., Šiška, Ľ., & Kováčová, N. (2018). Differences in physical activity, joy of movement and quality of life of boys and girls from secondary schools. In A. Hubinák (Ed.), *Current problems of physical education and sports VII* (pp. 25–35). Ružomberok, Slovakia: VERBUM.

[5] Šutka, V. (2015). Improving the quality and health of adolescents by means of physical activity at elementary and high schools. Final report of the KEGA 014UKF-4/2013 Grant.

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Oral Presentations

Biomechanics of Sport



VERTICAL JUMP PERFORMANCE IN FEMALE VOLLEYBALL PLAYERS

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Purpose: Vertical jumping height is recognized as a determinant factor in elite volleyball performance. There are many different jumping height results in a group of female volleyball players in previous studies and opinions on the role of age to jumping abilities are inconsistent [1]. The aim of this study was to verify the effect of age to vertical jump performance (height flight – hf) in sgquat jump (SJ), countermovement jump (CMJ) and continuous jumps (CJb) and to determine the take-off efficiency (η) in 45-s CJb. We assume that hf and η will be affected by the age and we expect lower values in a control group.

Material & Methods: 7 female volleyball players (PRO): age = 25.3 ± 3.81 years, 10 young competitive female volleyball players (U16): age = 15.5 ± 0.84 years, and 15 female university students (CONTROL): age = 22.9 ± 0.81 years participated in this study. Force platform Kistler Quattro Jump 9290BA was used to assess jumping performance during SJ, CMJ and 45-second CJb.

Results: Jumping height values in SJ were in PRO 38.5 ± 2.36 cm, in U16 38.34 ± 2.90 cm and in CONTROL 32.15 ± 5.36 cm. Differences between two volleyball players groups were not significant ($p > 0.5$). Jumping height in CMJ also did not significantly differ in PROF (40.50 ± 3.44 cm) and U16 (39.39 ± 3.08) groups. The differences with CONTROL (33.59 ± 5.02 cm) group were significant ($p \leq 0.05$). Similar trend was observed in CJb, where jumping height results of PRO and U16 did not significantly differ and CONTROL group achieved significantly lower values. The efficiency during take-off was in all female groups only up to 33 % and there were no significant differences between groups.

Conclusion: Results did not confirm neither the role of age to vertical jumping height performance in female volleyball players nor the effect of age to efficiency during take-off. These finding should be taken into account by volleyball coaches during talented individuals identification.

Keywords: continuous jump, countermovement jump, squat jump, take-off efficiency

References:

[1] Nikolaidis, P., Afonso, J., Clemente-Suarez, V., Alvarado, J., Driss, T., Knechtle, B., & Torres-Luque, G. (2016). Vertical Jumping Tests versus Wingate Anaerobic Test in Female Volleyball Players: The Role of Age. *Sports*, *4*(1), 9. https://doi.org/10.3390/sports4010009

Acknowledgement: This study was supported by SGS 21120, Specific University Research Grant provided by the Ministry of Education, Youth and Sports of the Czech Republic.

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SPEED ANALYSIS OF THE BREASTROKE PULL-OUT USING SWIMU SYSTEM

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Purpose: The aim of the thesis/ article is to analyze the development of swimmer´s speed after the breaststroke turn. We watched and compared the development of speed in the phases following the Turn, Push-off, Glide and Pull-Out of the chosen swimmers. We have chosen research questions: At what speed does the swimmer start executing the first stroke from the glide position considering the race speed? What is the average speed after the turn in comparison with the speed in the rest of the track? For how long is the swimmer´s speed lower during the pull-out than their race speed?

Material & Methods: The research sample consist of 5 female swimmers at national level. Data was collected with the use of an inertial measurement unit (IMU) of our own construction (SwIMU).

Results: In the results we focused on the qualitative analysis of individual Pull-out phases.

Conclusion: In this track swimming section, the swimmers do not have a perfectly mastered synchronization of movements. We can spot the space for improvement of the race results.

Keywords: breaststroke, IMU, push-off, swimming, turn

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INFLUENCE OF DIFFERENT LOAD OF SCHOOLBAG ON SHAPE AND PRESSURE PARAMETERS OF THE FOOT IN PRIMARY SCHOOL PUPILS

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Purpose: The aim of the present study is to find out whether different weights of schoolbags have any effects on the pressure parameters of the foot while standing and shape differences of the foot while walking.

Material & Methods: 18 children participated in the research (12 girls, weight 33.8 ± 6.7 kg; 6 boys, weight 43.6 ± 8.9 kg; ages 9–11). The Footscan® (RSscan International, Belgium) system was used for detection of monitored variables. Differences in midfoot area of the dominant and non-dominant foot was scanned during walking, without and with wearing a schoolbag set on the level of body weight, where the levels were 10% (BW10) and 20% (BW20) adjusted to the overall weight of individual child. Also monitoring of distribution of foot pressures on the pad was solved in sagital a frontal plane while standing with different load of schoolbag.

Results: The results shown that bigger weights of schoolbags have effect on changes of the midfoot area of both dominant and non-dominant foot during walking in relationship without any back weight and with a high schoolbag load (BW20). Similar results were found also between low weight (BW10) and high weight (BW20) load of schoolbag in dominant foot. Based on the presents results it is possible to conclude that the weight of the schoolbag which is on the level of 20 percent of child's body weight can have effects on the changes in midfoot area on the dominant and non-dominant foot. In standing, the test persons shifted the weight on the forefoot with increasing of load of schoolbag.

Conclusion: The given results can be used for creation of future security measures in schools and for giving recommendations for parents to decrease the weight of schoolbags and providing more health risk prevention (drinking mode in schools, dual school supplies, spare school clothes for physical education etc.). It is essential to note that a great number of schoolchildren are transported to school by public traffic or car, therefore the effect of heavy schoolbag will not be evident.

Keywords: dominant and nondominant foot, midfoot, physical activity

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GROUND REACTION FORCES DURING ROLLER SKIING ON THE ASPHALT AND ON THE TREADMILL – CASE STUDY

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Purpose: Cross-country skiers use to roller skiing for specific training. Roller skiing needs specific space – smooth asphalt surface of a special track or specific wide treadmill. According to Kračmar et al. [1] is the activation of muscles during roller skiing on asphalt and on a treadmill is different. We expect that ground reaction forces during roller skiing on asphalt and on the treadmill will be different. The aim of this study was to evaluate the differences between ground reaction forces and temporal parameters during V2 technique roller skiing on asphalt and on the treadmill.

Material & Methods: In this case study participated female cross-country skier (age = 33 years, height = 1.80 m, weight = 70 kg). Measuring insoles Moticon Science (Moticon, Munich, Germany) were used to assess ground reaction forces and temporal characteristics during roller (Pro-Ski, Sterner group, Dala-Järna Sweden) skiing V2 technique on asphalt surface and on the treadmill Nosac (Nosac, Ústí nad Labem, Czechia). The speed of roller skiing was 20 $km \cdot h^{-1}$. The flat part with a flying start was measured in 20 sec. The study analyzed maximal ground reaction force [N] and these temporal parameters: mean gait cycle time CT [s], mean gait cadence CAD [strides/min], mean stride (STR) and stance (STA) duration [s].

Results: Maximal ground reaction forces for the left (dominant) foot during V2 roller skiing on asphalt was 1568.47 ± 70.09 N and on treadmill 1601.36 ± 24.22 N. For the right foot were values significantly lower (asphalt: 959.24 ± 17.92 N and treadmill 962.06 ± 17.0 N), but the variability was lower too. Temporal characteristics showed that all important phases were shorter on the treadmill and cadence was higher.

Conclusion: Results confirmed the differences in ground reaction forces and temporal characteristics during roller skiing on asphalt and on the treadmill. The acting ground reaction forces are higher during roller skiing on asphalt and temporal characteristics showed that all important phases were shorter on the treadmill. In view of the fact that the cadence in the same speed of roller skiing was higher on the treadmill than on asphalt significantly, we suggest a reduction of speed on the treadmill for training and for simulation of similar condition.

Keywords: force, reaction force, roller skiing, treadmill

References:

[1] Kračmar, B., Chrástková, M., & Bačáková, R. (2016). *Fylogeneze lidské lokomoce*. Praha, Czechia: Karolinum.

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COMPARATIVE ANALYSIS OF THE KAYAK FORWARD STROKE

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Purpose: The aim of this study is to describe and to compare the kayak forward stroke performed in the pool with countercurrent and on the flat water.

Material & Methods: The research was conducted in an intentionally chosen sample of eight kayakers with high level of performance in whitewater slalom. We watched activity of twelve selected muscles during kayak forward stroke performed in the counterflow pool and on the flat water by surface electromyography and kinematic analysis. Study evaluates intraindividual and subsequently interindividual muscle timing and the size of the muscle activation due to maximal voluntary contraction.
We used comparative analysis and the dates was measured by surface electromygrafy and 2D video-analysis.

Results: The results proved the same timing of muscles in counterflow pool and on flat water. The muscle activity in the counterflow pool was bigger than on the flat water.

Conclusion: From our results we can recommend a pool with counter current as replacement training tool. Compared with other used training devices (crank ergometers, paddling trainers and paddling pools) has one great advantage. It is the same placement of the fixed point and the preservation of the feeling grasping water.

Keywords: counterflow pool, kayak, paddling, surface electromyography

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Oral Presentations

Current trends in Physical Education



DIGITAL LITERACY IN PHYSICAL EDUCATION

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Purpose: This article deals with the analysis of application of digital technology in physical education and of the development of digital literacy among elementary school pupils and secondary school students. The decisive criterion for the analysis was that a digital resource would enable pupils to actively participate in the use of digital technologies.

Material & Methods: In order to evaluate the current situation with regard to digitization in physical education, we used the content analysis of documents created in connection with the implementation of previous projects. We made an assessment of the digital resources that have been created so far from the available Ministry of Education, Youth and Sports databases.

Results: The evaluation of the results shows that physical literacy can, in view of the goal and idea of physical education as such, develop digital literacy to a limited extent, even though the entertainment industry and the development of technologies have grown significantly over the last decade.

Conclusion: The possibilities of using digital literacy in physical education are found, for example, in the use of devices identifying the physiological response of body load, GPS use, virtual reality, etc. Finally, it can be summarized that digital resources can be used in physical education to improve and make learning more attractive. This article contribution was created as part of the project "Support for the Development of Digital Literacy"

Keywords: digitalization, literacy, project

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TO MOVE AND TO BE MOVED – EXPLORING CHILDREN'S OWN MOVEMENT AND INTERACTIONS IN PHYSICAL EDUCATION

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Purpose: In physical education (PE), children with varying backgrounds, competencies, interests and experiences move together. Children do a wide variety of activities where the emphasis is often in fitness and sports. Major part of children enjoy the subject while some experience the content meaningless, seldom master the activities and/or feel excluded. In addition, many children express a desire to choose more often what activities to do and how to move. Usually, the teachers choose and instruct the activities. The purpose of this study is to explore the diversity of movers and children's own movement in the context of PE. The particular questions are how children move and interact within the frames of an activity their teacher has chosen and instructed.

Material & Methods: The data material is produced in observations and the participants are 9–10 year-old children. Theoretically, the study is inspired by Baruch Spinoza, affect theories and phenomenologists Jonathan Smith, Thomas Fusch and Sabine Koch.

Results: Through examples from a tag-role game sheep and wolverine, I show how each child moves and interacts in their own ways and how children's choices, actions, and interactions contribute the course of the activity. Some children move constant and seek contact with one another following the descriptions of roles of sheep and wolverines. Other children run around the playing area but seldom take contact with someone else. Furthermore, some children only engage in the game in intervals or mostly stand by themselves. Movement mix with immovable and invitations mix with ignorance and exclusion. Children's movements and the game they play together emerge ongoing in multiple, unpredictable levels.

Conclusion: I conclude that the activity the teacher has chosen and instructed creates frames for how children are expected to move and interact and that in many cases children follow the instructions and game rules. However, neither movement nor interactions are dependent on following the instructions and game rules. To get involved in common purpose and to make the particular game to work however requires sensitivity and capacity to relate to changing circumstances and other children as well as an invitation or acceptance from others.

Keywords: diversity, interactions, movement, physical education

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THE PERSONALITY OF THE PHYSICAL EDUCATION TEACHER: A SCOPING REVIEW

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Purpose: The teacher's personality is increasingly quoted as one meaningful factor of successful lessons [1]. Mayr [2] showed the relationship between the teacher's personality and professional competence as well as satisfaction with teaching. The physical education teacher (PET)'s personality is also stated as pivotal point of their professional competence [3]. There are studies examining the PET's personality but the term personality is construed differently and analysed in various contexts. This scoping review therefore aims at a) analysing empirical findings on the PET's personality and examined correlates plus b) outlining the underlying understanding of personality and applied inventories in studies investigating PETs.

Material & Methods: The review followed Arksey and O'Malley's framework for scoping reviews [4]. Two independent reviewers fulfilled the screening and data extraction process. The scope of the review spanned German and English empirical studies of the PET's personality in school context.

Results: Searching 11 databases yielded 2164 different hits. After the screening process, 17 studies were considered eligible for final analysis. Additional analyses resulted in extra 6 studies. 13 studies examined PETs, nine examined students, one both. All included studies were cross-sectional – 22 quantitative, one qualitative. Eleven studies aimed at obtaining an external view on the PET's personality, either by examining students or colleagues of other subjects. Students mention fair, understanding and humorous as desired features. Five studies aimed at describing the PET's personality in general (n = 3) or their vocational personality (n = 2). Studies comparing the PET's and general subject teacher's personality did not find significant differences. Seven studies surveyed the PET's personality in relation to another variable (i.e. burnout, practised sport by PET, students' behaviour, entrepreneurial organisational culture). These studies showed that personality aspects are related to several correlates, e.g. burnout development. 16 studies followed a trait psychological approach, using 15 different inventories.

Conclusion: Examining the PET's personality has become increasingly popular in the last decade. Describing personality in traits prevails the research field. Most studies lack practical implications of the theoretical results. Future studies should examine the PET's personality as well as relevant correlates for gaining knowledge on how PETs can adequately make use of their individual personality when teaching.

Keywords: personality, physical education, physical education teacher

References:

[1] Hattie, J. (2009). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London, UK: Routledge.
[2] Mayr, J. (2011). Der Persönlichkeitsansatz in der Lehrerforschung. In E. Terhart, H. Bennewitz, & M. Rothland (Eds.), *Handbuch der Forschung zum Lehrerberuf* (pp. 125–148). Münster, Germany: Waxmann.
[3] Miethling, W. D., & Gieß-Stüber, P. (2007). *Beruf: Sportlehrer/in*. Hohengehren, Germany: Schneider.
[4] Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32.

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PRO-SOCIAL AND ANTISOCIAL VALUES IN PHYSICAL EDUCATION: THE VALIDITY AND RELIABILITY OF FAIR PLAY QUESTIONNAIRE IN PHYSICAL EDUCATION (FPQ-PE) – ALBANIAN LANGUAGE

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Purpose: The main aim of this study was to translate and validate into Albanian language the questionnaire that measures pro-social and antisocial behaviors in PE class [1].

Material & Methods: In order to validate the questionnaire, a sample of 597 middle school students from Tirana, Albania, were involved. The sample was composed of 280 students (mean age = 13.2 yr, SD = 1.2) to perform Exploratory Factor Analysis (EFA), reliability, reporting Cronbach Alpha (CA) coefficient, and the test-retest validity. For the Confirmatory Factor Analysis (CFA), it was used a sample size of 317 student (mean age = 14.32 yr, SD = 7.3).

Results: KMO > than 0.5 and Bartlett's Test < 0.01 (KMO – 0.820, $\chi^2 = 1153.330$; $p = 0.001$), have indicated that the EFA could be performed. EFA has revealed that there were four factors; two for pro-social behaviors: respect conventions ($\alpha = 0.683$) and respect towards teammates ($\alpha = 0.616$) and two for antisocial: cheating ($\alpha = 0.765$) and gamesmanship ($\alpha = 0.742$). Related test-retest correlations, for pro-social ($r = 0.64$), ($p = 0.001$), and antisocial ($r = 0.57$), ($p = 0.001$). Finally, CFA has indicated a good model fit ($\chi^2 = 196.68$, d.f. = 84, $p = 0.001$, RMSEA = 0.065 and CFI = 0.92).

Conclusion: According to the results of our study, the questionnaire has shown reliability on measuring pro-social and anti social values in PE class. Therefore, the questionnaire can be used as an effective tool to help Albanian PE teachers and sports educators to understand the social and educational values dealing with sport in Albanian schools.

Keywords: questionnaire, physical education, pro-social / antisocial values

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FINDINGS ON STUDENTS' PERSONALITY IN THE CONTEXT OF PHYSICAL EDUCATION: A SCOPING REVIEW

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Purpose: Students' individual personality crucially affects their perception of different processes in school, e.g. their perception of lessons, their learning motivation or their learning success [1]. In the field of Physical Education (PE), studies showed relationships between students' personality traits and e.g. their performance in PE [2]. Due to various existing understandings of the concept personality, the literature in the field is hard to capture. Therefore the scoping review aimed at giving an overview of the literature regarding students' personality in PE context. The intention was to analyse a) researched correlates of students' personality in PE context and b) the understanding of personality in existing studies.

Material & Methods: The scoping review was conducted following the methodical framework of Arksey and O'Malley [3]. The subject matter of the research was English or German empirical studies investigating students' personality in PE context. Two independent reviewers fulfilled the screening process and the data extraction.

Results: After duplicate removal, 3255 references passed through the screening process – title, abstract, full-text screening. Finally, 25 studies were included in the analysis. Screening reference lists, authors and key journals yielded one additional study eligible for analysis. 15 out of the 26 studies followed a cross-sectional design and investigated students' personality in relation to different variables. The majority of the analysed studies showed a relationship between personality traits and students' performance in PE (n = 10) or between personality traits and students' inner processes (n = 5), e.g. their motivation or attitudes towards PE. The remaining 11 studies were intervention studies. They examined the impact of more PE on students' personality development and ascertained all at least a partial influence. The majority (n = 16) of the studies followed a trait theoretical understanding of personality.

Conclusion: Personality has turned out as a promising research field in PE context, which gives reason for further studies focussing on students' personality. Knowing students' personality profile could facilitate student-centred teaching. The operationalisation of personality has developed into a more consistent understanding over the last 20 years. The predominant trait-based approach offers appropriate inventories for further studies.

Keywords: personality, physical education, students

References:

[1] Hattie, J. (2009). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London, UK: Routledge.
[2] Čuljak, Z. & Mlačić, B. (2014). The big-five model of personality and the success of high school students in physical education. *Croatian Journal of Education, 16*(2), 471-490.
[3] Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32.

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FOLK OUTDOOR GAMES IN "HEALTHY CHILD AT SCHOOL AND IN THE FAMILY" PROJECT

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Purpose: to analyze impact of folk outdoor games on primary school pupils health condition under realization of the "Healthy child at school and in the family" project.

Material & Methods: academic programs analysis; observation; HAM test; mathematical statistics methods. *Participants:* 358 primary school pupils aged 6–10 participated in the experiment, among them 186 persons were included into experimental group (EG), and 172 persons – into control group (CG), as well as primary school teachers, PE teachers.

Results: Purposefulness of primary school pupils physical education system improvement is grounded at the basis of academic PE programs for 1–4 forms of general secondary schools pupils analysis and practical experience generalizing. Due to these a long-term project "Healthy child at school and in the family" was developed.
Physical-educational and health-giving block of the project is aimed at preventing hyperkinesia negative impact on primary school children health. Among the main means of pupils' physical activity we consider folk outdoor games. They are chosen in accordance with primary school pupils' health condition, their physical training, age and season.
Pupil's observation during classes and non-school hours testifies increase in their physical and cognitive activity. Health saving effect of folk outdoor games is proved by HAM (health, activity and mood) test conducting in the EG: 81 % of pupils health improved, 92 % mood increased and 78 % general activity grew.

Conclusion: Implementing folk outdoor games into primary school educational process positively influences pupils physical and psychoemotional condition. Research results prove that due to this children well-being increases, steady motivation to health saving behavior and conscientious attitude to their own and other people health are developed. Balance of physical and intellectual activity contributes to 1-4 forms pupils effective health saving and increase in their academic achievements.

Keywords: folk outdoor games, general secondary school, health saving, primary school pupils

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PHYSICAL LITERACY AND ITS ATTRIBUTES FOR LIFELONG LEARNING IN ADOLESCENT POPULATION

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Purpose: Physical literacy is quite a new concept that should be acquired and developed by everybody. It contains four main attributes. These attributes are necessary in case each person wants to perform every day physical activity to maintain healthy lifestyle [1]. Self-efficacy is one of the attributes that allows a person to organize and execute various activities, here mainly exercises, even if the situation is not very favorable and he/she must overcome some obstacles. Regarding physical exercise self-efficacy we hypothesized that adolescent boys would have higher self-assessment of their physical literacy than adolescent girls.

Material & Methods: We used Czech version of PLAYself questionnaire that was completed by 367 adolescents (164 boys and 203 girls) in basic and secondary schools. The average age of our participants was 15.14 years. The questionnaire contains 21 questions mainly answered using Likert scale. The questions are divided into four parts – environment, physical literacy self-description, literacies, and fitness. Descriptive statistical procedure was used to find out the differences between boys and girls.

Results: Boys assessed their own level of physical literacy higher than girls (62.33 vs. 58.34 %) but the difference was not significant. Boys are mostly active for the whole year while girls prefer doing physical activities in summer. 82 % of adolescents think that movement, activities and sports are very important at school and at home with family while 92.4 % think that they are very important with friends. Self-assessment of physical literacy also differs according to age, the lowest score was in 15-year-old pupils. 71 % of boys think that their fitness is good enough to let them do all the activities they choose compared to 56 % of girls.

Conclusion: It is necessary to rotate various exercises within different environments. In developing physical literacy all necessary people who are concerned should cooperate. Fundamental force exist in a family and later schools, sport clubs, and other collaborating partner should understand the meaning of physical literacy and pay attention to its development.

Keywords: knowledge, motivation, physical activity, physical competence, self-efficacy

References:

[1] Vašíčková, J. (2016). *Pohybová gramotnost v České republice*. Olomouc, Czechia: Univerzita Palackého.

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INFLUENCE OF INCREASE OF SENSOMOTOR TASK DIFFICULTY ON NEURAL SYSTEM AROUSAL AND MOTORIC PERFORMANCE

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Purpose: The objective of this study was to find out whether an increase in the difficulty of a performed movement task with certain demands on perception, thinking, attention, and memory can influence activation of the nervous system, and vice versa.
If the difficulty of a sensomotor task is higher, the time needed to achieve the goal is extended – this fact was explored by Fitts already in 1954. He created a predictive model of human movement behaviour, known as Fitts' law. The objective of this study was to find out whether an increase in the difficulty of a performed movement task with certain demands on perception, thinking, attention, and memory can influence activation of the nervous system, and vice versa. Activation of the nervous system is influenced by a large number of cognitive processes.
Requirements of current everyday life underline the importance of accurate and rapid response to the created situation. In addition to our ability to physically handle movement responses, it is very important to decide, which type of movement response is selected, and how a particular movement is programmed so that the movement response to the created situation could be adequate.
It is assumed that if the difficulty of a sensomotor task is increased, the length for which a certain task is performed by probands, will be extended. By increasing difficulty of the task, the activation of the nervous system is changed.

Material & Methods: The test sample consisted of 84 persons (n = 84). All probands were students of the Faculty of Education of the University of West Bohemia, Pilsen, Czech Republic Of these, 42 females and 42 males were at the average age of 21.4 ± 2.78 years. The activation level of the nervous system was objectified by the measurement of skin conductivity with the device PowerLab, ML 116 GSR Amp from ADInstrument. The device is equipped with the LabChart software, which records a time series of skin conductivity data. The level of sensomotor performance was verified by the support drawing test. The probands carried out this test in three levels of difficulty. The non-parametric Friedman test was used to compare time variables, average skin conductivity, and average levels of changes in skin conductivity. The Kruskal-Wallis test was used to compare the results of males and females, individuals who made errors, and who did not make errors. In addition to statistical significance, objective significance was used for the evaluation of data.

Results: The non-parametric Friedman test was used to compare time variables, average skin conductivity, and average levels of changes in skin conductivity. The Kruskal-Wallis test was used to compare the results of males and females, individuals who made errors, and who did not make errors. In addition to statistical significance, objective significance was used for the evaluation of data.

Conclusion: This research confirmed our expectations that the increased difficulty level of a sensomotor test of bimanual co-ordination has a significant impact on sensomotor performance, as well as on changes in activity of the autonomic nervous system. The fact that increasing the difficultly significantly extends the test execution time and error rate, confirms our assumptions that the difficulty level has been correctly chosen from the viewpoint of performance comparison in our individual measurements, and this was even manifested in the changes of the values of both EDA variables.
This study has a limited validity for the college student population at the age of 20–25 years.

Keywords: activation of the nervous system, electrodermal activity, sensomotor learning

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KINEMATIC ANALYSIS OF HIP ANGLE PARAMETERS OF MAE-GERI KICK

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Purpose: Techniques used in martial arts are characterized by the use of specific movement patterns, which affects the strength, power and speed developed by the player [1,2].
The aim of the study was the kinematic analysis of the hip joint during the kick in the air on the shields and in contact with the second player in advanced and beginners competitors training kyokushin karate.

Material & Methods: Kinematic data was recorded using a motion tracking Vicon system with the sampling frequency of 250 Hz [3]. Matlab 2016a with the BTK Toolkit library and the Mokka software were used to analyze the data. The non-parametric Mann-Whitney U-test was used for statistical analysis. Comparative analysis was performed in 26 players: G1 – 13 with advanced achievements, G2 – beginners.

Results: In the comparative analysis, significant differences were observed in the movement of the adduction and rotation in the hip joint. This may indicate that there is a faulty proprioceptive neuromuscular targeting in beginners and the deficiency of movement anticipation in relation to the mae- geri technique.

Conclusion: The kinematic analysis provided significant differences in the of the motor model assessed for the hip joint depending on the level of advancement of the competitors. What can be used in sports training at the initial stage.

Keywords: kyokushin karate, martial arts

References:

[1] Cynarski, W., Wąsik, J., Szymczyk, D., & Vences de Brito, A. (2018). Changes in foot pressure on the ground during mae-geri kekomi (front kick) in karate athlete - case study. *Physical Education of Students*, *22*(1), 12. https://doi.org/10.15561/20755279.2018.0102
[2] Zvonar, M., Kolarova, K., Zahradnicek, V., Reguli, Z., & Vít, M. (2012). Kinematic Analysis in Combative Sports. IDO MOVEMENT FOR CULTURE. *Kinematic Analysis in Combative Sports*, *12*(4), 12–19.
[3] Vicon®. (2010). *Plug-in Gait Product Guide - Foundation Notes*. Oxford, UK: Vicon® Motion Systems Ltd., Oxford Metrics Group.

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THE FLEXIBILITY OF PUPILS AT SECOND LEVEL OF PRIMARY SCHOOLS

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Purpose: The aim of the survey was to find out the level of flexibility of 11–15 year old pupils of the second level of elementary schools. We realized the survey at 7 elementary schools in the Western part of Slovakia.

Material & Methods: Alltogether we surveyed 500 pupils – boys were tested by 4 selected tests to determine the flexibility according to Sedláček and Lednický [1] and one test according to Měkota and Blahuš [2]. We divided the results by decimal age into 5 categories (11, 12, 13, 14 and 15 year).

Results: We found that the mean values in the Stand and reach and Sit and reach declines as the age increases, e.g. at 11 years old 0.25 (or 16.19 cm) respectively, 15 years old – 2.34 (or 15.24 cm). It is alarming that pupils have negative values in the tests. The different results of both tests are due to the inconsistency of the measurement methodology. On the other side, the Hull flexibility to left and right side as well as the Deep sit and reach test show gradual improvement with increasing age [2]. All categories were tested in Stand and reach and Sit and reach we compared with the standards according to Sedláček – Cihová [3]. The lowest score is 1 point, which was reached by most of the children (132 or 105 pupils) in both tests. Test comparison with the Eurofit [4] also shows deterioration in each category. The smallest 4.31 cm is a category of 13 year olds, the worst was deteriorated by 15 year old more than 10.87 cm.

Conclusion: Flexibility, although not a limiting factor in many sports, is a necessary part of ordinary activities in human life, and therefore its development should be part of the physical activity of every age. The results of the survey show that flexibility is worse with increasing the age of children.

Keywords: flexibility, level, pupils

References:

[1] Sedláček, J., & Lednický, A. (2010). Ohybnosť. In *Kondičná atletická príprava*. Bratislava, Slovakia: Slovenská vedecká spoločnosť pre telesnú výchovu a šport.
[2] Měkota, K., & Blahuš, P. (1983). *Motorické testy v telesnej výchove*. Praha, Czechia: Státní pedagogické nakladatelství.
[3] Sedláček, J., & Cihová, I. (2009). *Športová metrológia*. Bratislava, Slovakia: ICM AGENCY.
[4] Moravec, R., Kampmiller, A., & Sedláček, J. (1996). *Eurofit – telesný rozvoj a pohybová výkonnosť školskej populácie na Slovensku*. Bratislava, Slovakia: Slovenská vedecká spoločnosť pre telesnú výchovu a šport.

Acknowledgement: The paper is based on support of the grant role of MŠ VVŠ SR – VEGA No.1 / 0027/17 entitled "Possibilities of genetic testing in the identification of sports talent".

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USE OF VIRTUAL REALITY IN SPORTS, REHABILITATION AND PHYSICAL EDUCATION

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Purpose: Within last years we could observe a great advancement in the area of immersive virtual reality (VR), which came together with the development of information technologies. Acquisition cost is lower and disadvantages of VR (resolution, field of view, cable management, latency) are steadily being eliminated (e.g. wireless technologies, higher computing performance etc.). Due to above mentioned factors VR is starting to be available not only for specialized centers, but also for end users, education, sport clubs etc. Purpose of this contribution is to provide basic information about virtual reality and possible use cases of VR in physical education (PE), rehabiliation, sport and to show limitations of current VR technologies.

Material & Methods: Part of this contribution is a brief introduction to VR technologies (terms, technological specifications). Introduction of current studies on the subject and possible use cases for VR use in mentioned areas (sport, PE, rehabilitation). The type of this contribution is a literature review.

Results: A number of studies were carried out, which prove positive physiological effect of VR (e.g., calories burn). A number of researchers have tried to prove that VR can positively influence decision making in sport. VR can also be used very effectively for ideomotor training transferred to the real life sports environment conditions.

Conclusion: Virtual reality seems to be both new and unusual supplement for sports training, which could have a much more important role in the future, it could also be significant for tactical or psychological preparation during training. VR could also help with search for talented individuals. In education VR also poses as a very effective learning method, because immersion is much higher than with a video or a textbook.

Keywords: education, performance analysis, rehabilitation, sport training, virtual reality

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THE FEATURES OF PHYSICAL HEALTH INDICATORS AS DETERMINANT OF LIFE QUALITY OF THE PARTICIPANTS IN FIGHTINGS OF UKRAINE

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Purpose: The aim of the research was the evaluation of physical health indicators as an important component of the quality of life of combatants in the East of Ukraine, depending on their marital status.

Material & Methods: A survey was conducted of 50 demobilized military, who trained a course of rehabilitation in the Volyn hospital for the disabled soldiers (Lutsk, Ukraine). The average age of the military was 34.88 ± 9.44 years (the youngest soldier is 21 years old and the oldest is 59 years old). Depending on the marital status, the military was divided into 3 groups: unmarried – 16, married – 25 and divorced – 9 people. The assessment of quality of life indicators was done using the Ukrainian version of the International Questionnaire SF-36 in the range from 0 to 100 points, where 100 points are a full health. The statistical processing of results is carried out using the program Statistica 6.1.

Results: It was found that the index of physical health in all explorers is 39.84 ± 7.89 points. At the same time, its value in the unmarried military is the highest – 44.6 ± 7.6 points; somewhat lower in the married – 37.6 ± 7.9 points and in the divorced – 37.4 ± 4.4 points. The study of the component structure of physical health revealed the highest values of the PA (Physical activity) score: for unmarried people – 80.6, for married – 63.2, for divorced – 67.8 points, with an average sample value of 69.6. The indicator of the GH (General Health) in the 1st group is 56.4, in the 2nd – 49.4 and in the 3rd – 46.3 points, with an average of 51.08. The indicator of the BP (Pain) for unmarried persons is 57.9, while for the married is 44.1; in divorced – 35.9 points, among them 47.0 points. The rate of RP (The role of physical problems in the limiting life), the most significant decrease the physical component of quality of life which in the unmarried military is 48.4; in the married – 32.0 and in the divorced – 11.1 points, while an average value is 33.5.

Conclusion: The state of physical health of unmarried military is much better than of married and divorced military, that is connected with their younger age. The lowest rates were recorded in the divorced military at the critical value of the RP, which attributes them to a group of potential risks. The results of the study provide an opportunity to take into account the family status of combatants in the process of their rehabilitation.

Keywords: military, participants of battle actions, quality of life, SF-36

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THE INFLUENCE OF THE EXPERIMENTAL TEACHING PROGRAMME ON CHANGES IN THE LEVEL OF BASKETBALL SKILLS OF ELEMENTARY SCHOOL PUPILS

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Purpose: Sports games have long been one of the most popular themes in school physical and sports education. Basketball along with other sports games are among the most popular sports games. The contribution is part of the research project "Creating Textbooks and Teaching Tools for Physical and Sports Education Teachers at Primary and Secondary Schools with Focus on Basketball" (KEGA 026UMB-4/2017), which aims to determine changes in the level of basketball skills of pupils of selected elementary schools by means of the experimental teaching programme in the school year 2018/2019.

Material & Methods: The research is aimed at pupils of the 2nd stage of elementary schools during physical and sport education lessons. The level of basketball skills is assessed by means of basketball skills tests, taking into account the age group of elementary school pupils. The selection of tests includes individual game skills – shooting, passing and catching the ball, dribbling. We have included the experimental program into the plan of the thematic unit basketball. It contained a complex of methodical forms (preparatory exercises, game exercises and preparatory games) focused on selected individual game skills, game combinations and game systems.

Results: As the research is ongoing during the school year 2018/2019, the results of the research are in the processing phase. The preliminary results are presented on the basis of the pre-survey. We presume that our experimental program will have a positive impact on change in the level of our chosen game skills.

Conclusion: We anticipate that the results will widen the knowledge about the development of basketball skills and their diagnostics and will enrich the theory and practice in physical and sports education.

Keywords: basketball skills, diagnostics, school physical education and sports

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THE INFLUENCE OF SPORTS PREPARATION ON THE LEVEL OF AGILITY IN TOP HOCKEY PLAYERS

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Purpose: The aim of the paper was to find out the influence of sports preparation on the level of agility in top hockey players during the transition period

Material & Methods: We observed in our contribution top hockey players who had a 10-week sport preparation during which they had completed entrance, intermediate and final measurements under the same conditions. The form of weekly microcycles did not change but the training content varied throughout the preparation according to the previously established plan. The load and intensity of exercises increased or decreased every week. The players prepared individually last 3 weeks. We have selected the only one Agility test (Illinois test) from all tests the players realized. Testing took place on 15. 5. 2017, 26. 6. 2017, 24. 7. 2017, what represents together ten weeks.

Results: The results of the work were recorded and statistically evaluated at 1 % and 5 % level of significance using the Wilcox test. We recorded the best performances from the three measurements of agility test in the second test that players achieved in the final stage of preparation. The second best results were recorded in the first measurement before starting the sport preparation.

Conculsion: The worst performances were recorded in the third measurement and pointed to a possible reconsideration of the sporting organization in relation to the achieved results in tests.

Acknowledgement: The contribution is based on support of the grant task of the MŠ VŠŠ VEGA no. 1/0454/16 – "Complex movement ability agility and their possibilities of its development in selected sports".

Key words: agility, ice hockey, sports preparation

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SETTING THE CORRECT SITTING POSITION ON THE BICYCLE AS A BASIC PARAMETER EFFICIENT PEDALING

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Purpose: The cycling is accepted paradigm that the correct sitting position while riding a bicycle is a basic prerequisite for efficient pedaling. Many racing and recreational cyclists have sitting position the wrong set. The aim of our study is to describe the differences in setting of the sitting position using a Retül technique and riders themselves. We assume that setting the hide themselves riders will show errors in at least half of the riders.

Material & Methods: A research sample consisted of 90 recreational riders (18–50 years) who were set up using the Retül technique and compared to the previous state of set-up.

Results: More than 80 % of drivers had sitting position badly set key parameters (saddle height and handlebar drop, distance saddle and handlebar).

Conclusion: After setting the correct sitting position on the bicycle riders have created better conditions for the proper technique of pedaling a bicycle. The publication has been carried out within an internal grant PF UJEP 2018.

Keywords: cycling, Retül, sitting position

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MOTOR FITNESS IN PREMATURELY BORN CHILDREN AT THE AGE OF 6

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Purpose: Acknowledging developmental problems in prematurely born children in context of motor fitness assessment should be an essential element of preventive and therapeutic actions taken in this group of children. However, in perspective of past research this problem has not been acknowledged sufficiently and unequivocally. Thus the thesis aims at an assessment of motor fitness in prematurely born children in comparison to a control group.

Material & Methods: Research was conducted in the period between 2014 and 2018 on 1947 six-year-old children, attending preschool establishments in Kielce, Holy Cross Region, including 79 prematurely born ones. A control group of 80 children born at due time was isolated. Both groups of prematurely and at due time born children were tested by means of Sekita Motor Fitness Test which included: strength test (1 kg medicine ball overhand throw), power test (standing long jump), speed test (20 meters run), agility test (4 × 5 meters shuttle run). Statistics compilation was prepared with the use of *Statistica* programme.

Results: On the basis of the achieved results it was stated that prematurely born children presented lower motor fitness level in all motor tests compared to the ones born at due time, whereby differences were bigger in boys.

Conclusion: Achieved results prove that there exist so called remote consequences of a preterm birth. Prematurely born children present lower level of motor fitness. Thus it is vital to take therapeutical action in reference to an early support of motor fitness in children, which will surely influence favorably their current and future health condition and school maturity.

Keywords: development, motor fitness, prematurely born child

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PHYSICAL ACTIVITY IN FREE TIME IN 6-YEAR-OLD CHILDREN BORN PREMATURELY AND AT DUE TIME

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Purpose: The results of the research suggest that prematurely born children are particularly liable to different health problems as well as retardation and disorders in their development course. However, appropriate level of physical activity in free time is related to not only higher level of physical development and psychomotor one, but it is related to child's general better health condition and mood. The research so far indicate that the level of physical activity in prematurely born people is often lower in different age groups. Thus the thesis aims at the assessment of differences in physical activity between children at the age of 6, both born prematurely and at due time.

Material & Methods: The research was done in a period between 2014 and 2018 on 1947 children at the age of 6, including 87 prematurely born ones, attending preschool establishments in Kielce, Holy Cross Region. Furthermore, 90 children born at due time were selected as the control group. Parents of both children prematurely born and at due time were researched by means of a questionnaire devised by employees of Department of Auxology JKU in Kielce. It included questions related to parents' assessment of their children's physical fitness and to the time devoted to children's everyday physical activity, the sort of sports done recreationally, the time spent outdoor and indoor, watching TV or at a computer desk. Statistical compilation of the results was done by means of *Statistica* programme.

Results: Prematurely born children show lower level of physical activity than their peers born at due time because statistically relevant lower percentage of prematurely born children show very low or low level of it. Furthermore, the differences refer to preferences of spending free time because the prematurely born ones prefer passive or less active rest and this why they spend more time on watching TV, playing computer than on outdoor activities.

Conclusion: Low level of physical activity in prematurely born children can additionally inhibit their correct development. Thus there is this necessity of multipronged diagnosis of prematurely born children not only in reference to their development course but also to their lifestyles. Physical activity of prematurely born children should be a part of healthy lifestyle increasing effectiveness of undergone therapies.

Keywords: development, physical activity, prematurely born child

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LIFE SATISFACTION OF PHYSICAL EDUCATION TEACHERS AGAINST THE SELECTED PROFESSIONAL CONDITIONS AND SOCIO-CULTURAL FACTORS

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Purpose: The teacher's profession is perceived to a smaller extent in terms of prestige and high social rank in public space. Physical education teachers are a specific group, they low-evaluate their professional position. Examining the life satisfaction of physical education teachers and searching for connections between its level and selected occupational conditions and socio-cultural factors was the aim of the study.

Material & Methods: The study was conducted among 99 physical education teachers from the Opolskie Voivodeship. Polish adaptation of the life satisfaction scale SWLS [1] and author's questionnaire were used in this study. The questionnaire allowed to determine the way of spending leisure time and determine the length of time spending during the day in a sitting position.

Results: Neither differentiation by sex nor the level of education (on which the respondents worked) in relation to the analyzed parameters, were statistically significant.
Most teachers achieved a high level of life satisfaction (55.6 %), 41.4 % – an average level and only 3 % – low. The correlation between life satisfaction ratio and age, senioraty or time spending during the day in a sitting position were not statistically significant.
Only 45 % of researched teachers declared that if they had more time only for themselves, they would choose, among others, some form of physical activity.
Teachers with longer work experience declared more often willingness to take forms of rest without physical activity.

Conclusion: Promoting physical activity among physical education teachers as a way of spending leisure time seems to be a necessity.
It is worth looking for determinants of life satisfaction from various factors, not only socio-cultural, professional and economic; however studies should include a large population of respondents.

Keywords: life satisfaction, public health, teachers

References:

[1] Juczyński, Z. (2009). *Measuring tools in advertising health and health psychology*. Warszawa, Poland: Pracownia Testów Psychologicznych.

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TAPING AS A METHOD OF FLATFOOT CORRECTION IN ATHLETES

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Purpose: This paper presents the possibility of tapping as a means of therapy flatfoot deformity in athletes. The foot is a complex anatomical structure that provides contact with the body and mitigates the impact on the body. It creates a solid base and provides necessary footing for locomotion. The foot serves as a connection with the environment and with backward proprioception helps to keep postural stability in the standing, absorption and load transfer of bipedal locomotion. Optimal foot function is very important for postural stabilization and locomotion. Flatfoot means abnormal lowering of the longitudinal or transverse arches, or its disappearance. Each foot of function disorder causes changes of motion stereotype, transmit to higher levels of the movement system and is associated with disruption of pelvic and spinal stabilization. Increased muscle strength of the paravertebral muscles of the lumbar and cervical spine, which is the source of pain, is a compensatory mechanism. Flat foot can be caused by many factors. One of them is excessive sports activities, which leads to overloading of the musculoskeletal system and joints and the activities are very demanding for the whole organism. Flatfoot must be understood as a problem that affects the statics and dynamics of the whole body of the athlete. One of the options of conservative therapy is taping, which is one of the so-called functional conservative preventive techniques or the treatment of flatfoot. The application of the tape causes a reflection stimulation of the muscle arches in the foot. It is performed in a lying on the belly with flexion in the knee and ankle.

Material & Methods: We used the method of content analysis of available professional literature for presentation of a professional text. We used professional electronic resources for the graphical part of the paper.

Results: The paper introduces the method of taping, so-called the functional technique of prevention or treatment of flatfoot in athletes. Specifically focusing on the most common techniques taping arch of the foot.

Conclusion: Taping is one of the methods how to deal the secondary prevention and the flatfoot correction. Its effect is significantly effective and improves its effectiveness together with other correction methods. This is a simple method where we can experience the real available and inexpensive technique. All of these benefits are useful not only for sports physicians or physiotherapists, but also for other physical education workers and athletes.

Keywords: athletes, flatfoot, taping

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USE OF KINESIO TAPING IN SELECTED ACUTE AND CHRONIC SPORTS INJURIES

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Purpose: Participation in training and competition depends on the perfect health of the athlete. If a sports injury occurs, it is a serious problem, which will significantly affect his life. We can use a variety of techniques, methods and strategies to prevent and therapy sport injuries. Kinesio taping method has also been used in recent years, as one of the relatively simple, available and inexpensive techniques. The aim of the paper is to introduce with the principles of application and some basic Kinesio taping techniques in the most common acute and chronic sports injuries.

Material & Methods: We used the content analysis of the available literature to present the paper. We made a graphic part of the paper with the Nikon D3400 in the laboratory of Faculty of Health Studies Jan Evangelista Purkyně University.

Results: The paper introduces the application principles and some basic techniques for some acute and chronic sports injuries. We describe the techniques according to the damaged body parts, which are upper and lower limb injuries and damage to the back.

Conclusion: The paper describes one of the methods that can be used to solve acute and chronical sports injuries. We are increasingly using not only the preventive but also the therapeutic effect of Kinesio taping. Not only the effects, but also the availability and ease of application of this method are important reasons. Kinesio taping can be used not only by sports physicians or physiotherapists, but also by other physical education workers and athletes.

Keywords: kinesio taping, principles and techniques, sport injuries

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PHYSICAL PERFORMANCE CAPACITY AND FUNCTIONAL STATE OF MEN AND WOMEN SPECIALIZING IN MIDDLE-DISTANCE RUNNING DURING MESOCYCLE

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Purpose: Taking into account changes in the cardiovascular system of athletes during mesocycle enables to plan large and significant physical exertion, improve training process as well as functional abilities without prejudice to health. Aim to study the dynamics of functional capabilities and physical performance of qualified athletes specializing in middle-distance running.

Material & Methods: The survey involved 13 women and 10 men at the age of 17–24 specializing in middle-distance running who has qualified as First-and-Second-Class Candidates for Master of Sport. The physical performance of female athletes was evaluated on the basis of the results of the standard bicycle ergometer test Physical Working Capacity (PWC_{170}). Indicators of spectral analysis of heart rate variability of men and women were determined using Polyspecter program (Neurosoft, Russia).

Results. It has been determined that the women functional status and physical capacity during the mesocycle depend on the hormonal status changes during the menstrual cycle, in men – gradually increasing before the onset of fatigue. The highest rates of physical performance and functional capabilities among women athletes were recorded in the postmenstrual ($p < 0.05$) and postovulatory phases ($p < 0.05$); decrease significantly in ovulatory ($p < 0.05$), premenstrual and menstrual phases ($p < 0.05$). Indices of men physical performance and functional capabilities of the Candidates for Master of Sport and First-Class Sportsmans were increasing in the first, second, were highest in the third, were decreased in the fourth and were the lowest in the fifth microcycle ($p > 0.05$); Second-Class Sportsmans have the lowest level in the first, growth in the second, third and fourth levels and the highest – in the fifth level microcycles.

Conclusions. The results of the correlation between the level of manifestation of the functional capabilities of athletes and the performance of the mesocycle specific loads became the methodological basis for the development of their sports training programs.

Keywords: functional status, men, women

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COMPARISON OF AGGRESSION IN THE PERSPECTIVE OF PERFORMANCE MOTIVATION AND SPORT PERFORMANCE AMONG THE FOOTBALL PLAYERS

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Purpose: Sport is one of the important social phenomena and the aggression is becoming bigger and bigger social problem within the sport which needs to be guided. In terms of sport performance, it is necessary to know the individual manifestations of aggression, their activation factors, the personality traits of the individual as well as the social standards of the given sport.

Material & Methods: The aim of this paper is to bring the findings about the possible relationship between level of aggressiveness, motivation to perform and sport performance. The research group consisted of football players who were divided into sub-groups of which the first group included top players of Slovak national division (n = 47), and the second sub-group consisted of 4th and 5th league players (n = 54). As a diagnostic tool to determine the level of aggression, we chose the B-D-I test (Buss-Durkee Inventory) and to identify performance motivation we used D-M-V [1].

Results: We expect to find a difference in the level of aggressiveness and performance motivation among the top players of the highest national division and the players of the 4th and 5th leagues in football. Furthermore, we expect the correlation analysis to point out a relationship between aggressive behaviour and motivation of performance.

Conclusion: Based on results and findings, we can further influence and direct aggression through the psychological training of athletes in the training process as well as in the competition itself, thus contribute to better sporting performance.

Keywords: aggression, football, performance motivation, sport performance

References:

[1] Pardel, T., Maršálová, L., & Hrabovská, A. (1992). *Dotazník motivace výkonu: Příručka*. Bratislava, Slovakia: Psychodiagnostika.

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USE OF THE BRUININKS-OSERETSKY TEST OF MOTOR PROFICIENCY, SECOND EDITION IN SCHOOL PRACTICE

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Purpose: The aim of this study is to investigate the usefulness of the Bruininks-Oseretsky Test of Motor Proficiency, 2nd version for both diagnostic and evaluative purposes in school practice. A sufficient level of movement competence which is indicated by motor coordination and development of fundamental movement skills is a significant health and psychosocial factor. The Bruininks-Oseretsky, 2nd version, test is considered the most comprehensive diagnostic tool. It is used in the field of psychomotricity diagnostics in the Czech Republic. However, there are no Czech normative criteria.

Material & Methods: The research sample was made of 45 primary school children (23 girls and 22 boys) of average age 9.2 ± 1.4 years. For the estimation of a motor proficiency we used the Bruininks – Oseretsky test, 2nd version – complete form with German normative criteria.

Results: In the area of fine and gross motor development we evaluated 4 motor area composites with 8 subtest comprised of 53 items in the categories fine manual control, manual coordination, body coordination, strenght and agility. Scores for the test are reported as total point scores, standard scores and percentile ranks.

Conclusion: The test is useful for recognizing signs of different kinds of developmental coordination disorder in school practice. Teachers need to undertake a course to be able to use this test. It is not very easy to assess the test battery. For some of the children might the time to complete the test be too long (over 60 minutes). That is why it's recommended to split the test battery into more parts.

Keywords: Bruininks-Oseretsky test, developmental coordination disorder, psychomotricity

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EFFECTS OF TAURINE AND CAFFEINE PRODUCT ON SIMPLE AND COMPLEX REACTION TIMES

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Purpose: This study focused on the possible increase of individual reaction skills upon using the nutritional supplement (taurine and caffeine). The main objective was to determine if its consumption improved reaction skills, as prior studies have suggested. This study provides an additional contribution to the existing nutritional supplement literature, and verifies that taurine and caffeine functions as a stimulant, which can provides humans with faster response times to a selected stimulus. However, the effects have been verified using weak hypotheses that have been based on specific analyses, methods and factors that in some cases assured the positive or negative effects of this product. Thus, we decided to contribute to the canon of research to determine in detail the effect.

Material & Methods: The study included 17 participants (8 women and 9 men). The tests were performed twice, and each were separated by one week. Each individual abstained from drinking or using any substances that may have caused any cognitive arousal (e.g., caffeine, etc.) for 48 hours and were advised not to engage in any difficult physical activity before testing. The testing involved a double blind test. Each participant randomly consumed the prepared samples (capsule Biotech, USA) of substances labelled as A or B.
For the reaction skill measurement, a special reactimeter and Fitro Agility Check & Reaction 2.0 (Fitronic, s.r.o.) software was used. The software can generate stimuli in a range between 500 and 3000 ms, project them on a computer screen, and record the reaction time of the test subject (plate press).
The results of the simple and complex reaction time did not have a normal data distribution. Thus, nonparametric statistical methods were applied during the analysis. To statistically process the nonparametric data set, a Wilcoxon test was suitable because it compares dependent selections. The effect size threshold was set to $p < 0.05$. The overall data sample was achieved via purposeful selection.

Results: For the measured samples for SRT (simple reaction time) after taurine + caffeine capsule and placebo consumption, the analysis showed no significant difference (0.8 %). The CRT (complex reaction time) analysis showed that there is also no significant difference between taurine + caffeine and placebo (6.5 %).

Conclusion: Test substances do not affect the shortening of simple or complex reaction times.

Keywords: caffeine, complex reaction time, simple reaction time, taurine, Wilcoxon test

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THE RELATIONSHIP BETWEEN ISOKINETIC HIP ROTATORS TORQUE AND REACTION FORCES DURING FRONT KICK IN TRAINED SOLDIERS

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Purpose: The lower limb muscle strength is recognize as a useful performance and injury predictor, where the generated muscle force is dependent on the speed of the movement and the type of performed contraction [1]. The muscle groups, which are tested for force or moment output are selected in accordance of their contribution on specific movement tasks, e.g. hip flexors and abductors has been found to be important during front kicking [2], where different combat sport athletes showed similar moment values. Besides hip flexors and extensors, also the hip rotators moment might be useful for description of soldier front kicking ability.
Because the hip internal and external rotators are involved during the soldier front kick, the objective of this study was to find out the relationships between hip internal rotators and external rotators net torque at different movement speeds and kicking performance.

Material & Methods: Totally 26 professional soldiers (26 ± 4 years, 89 ± 5 kg, 182 ± 8 cm) from the special unit highly trained for front kicking participated in cross sectional measurement.
The isokinetic dynamometer (Humac Norm, CSMi Stoughton, M, USA) has been used to estimate moments of hip internal rotators and external rotators of non-dominant lower limb (support limb). The tested person lied supine performing three repetitions of maximal voluntary contraction at concentric muscle action at 30 °·s^{-1}, concentric muscle action at 90 °·s^{-1}, eccentric muscle action at 30 °·s^{-1} and eccentric muscle action at 90 °·s^{-1}, respectively. Each maximal effort was followed by 90 s rest interval and was performed in the range of 45 ° of internal/external hip rotation. The force platform (Kistler, Switzerland) has been used to measure the reactive forces during six soldiers kicks.

Results: The isokinetic force of external rotators were associated by Kendall τ with time to peak force during the kick ($\tau = 0.34$; $p < 0.5$), peak force ($\tau = 0.61$; $p < 0.5$) and contact velocity ($\tau = 0.54$; $p < 0.5$) during the kick.

Conclusion: The kicking performance can be increased by developing hip external rotators strength and by increasing hip external rotators antagonist strength ratio. This study has been supported by UNCE/HUM/032 by Charles University

Keywords: force, moment, muscle contraction, strength

References:
[1] Stastny, P., Lehnert, M., & Tufano, J. J. (2018). Muscle Imbalances: Testing and Training Functional Eccentric Hamstring Strength in Athletic Populations. *Journal of Visualized Experiments*, (135). https://doi.org/10.3791/57508
[2] Buśko, K. (2016). Comparison of Muscle Strength in Male Combat Sport Athletes. *Polish Journal of Sport and Tourism, 23*(4), 186-189.

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SLACKLINE AS MEANS OF KINESIOTHERAPEUTIC INTERVENTIONS OF INSTABILITY OF THE KNEE JOINT

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Purpose: The aim of this study is to point out the possibility of using slackline as means of kinesiotherapeutic interventions of instability of the knee joint compared to standard methods of kinesiotherapy.

Material and Methods: The study was attended by two groups of subjects with diagnosed knee joint instability. The first group of subjects (n = 8) went through standard practice physiotherapy (balance training, exercise on soft foams, BOSU, balance pads, a trampoline, static workout on a Stairmaster ("step"), plyometric training; part of the therapy has been the application of soft tissue techniques, the PIR, mobilization techniques). The intervention took place individually, at a frequency of twice a week, for a total range of 50 minutes. The second group of subjects (n = 8) went through training on balance widget Slackline, including the application of the techniques of soft tissue, the PIR and mobilization techniques. Trainings always lasted for 1.5 hours at a frequency of twice a week. For all subjects, it was after the end of therapy (5 weeks) carried out the examination of the stability of the knee joint using posturografic platforms Posturomed® with the help of the laser sensor, which wrote down the curve of statokineziogram into a graphics program.

Results: The measurement was able to confirm the assumption that the volunteers with therapy on the Slackline exhibit a higher level of ultimate stability of the knee joint in comparison with the group of subjects who have completed a standard procedure. Statistical analysis showed a significant difference in measured parameters in group of therapy on the Slackline (right-left deviation value: $p = 0.00022$; the value of anterior-posterior deviation: $p = 0.00032$)

Conclusion: Slackline meets the requirements for an effective and intensive training of stability for the instability of the knee joint. Slackline can be included in kinesiotherapeutic procedures and upgrade the options for selecting adequate therapy.

Keywords: instability of the knee joint, kinesiotherapy, Slackline

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THE STATE OF PHYSICAL ACTIVITY OF HIGHER INSTITUTION STUDENTS IN UKRAINE

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Purpose: The results of scientific researches demonstrate that students of higher educational institutions tend to decrease physical activity, which requires additional researches.

Material and Methods: The methodology of International Physical Activity Questionnaire (IPAQ) – the International Survey on Physical Activity, was used. In total, 895 students of the 1–4 years of full-time education at the *Lesya Ukrainka Eastern European National University* and the National University "Kyiv Polytechnic Institute" participated in the pedagogical research.

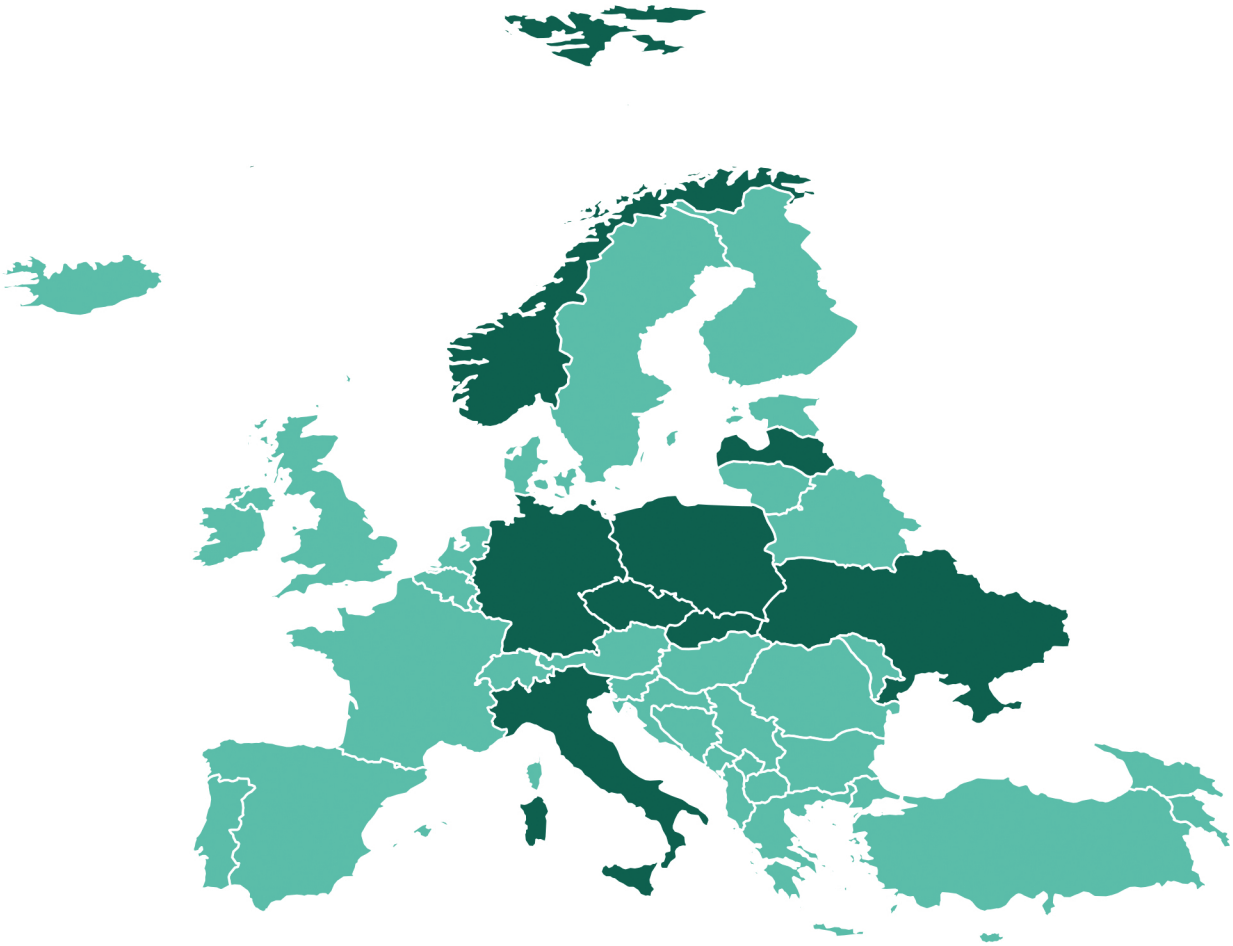
Results: In the vast majority of respondents (66.3 % of boys, 73.4 % of girls) there is a low level of physical activity. Almost a quarter of students (26.9 % boys, 22.1 % girls) have an average level of physical activity and only 6.8 % (boys) and 4.6 % (girls) have a high level. The decrease in the number of students with low level of physical activity in the second year of study was due to an increase of the number of middle-level people, so a change in the living conditions and lifestyle of youth. At the third and fourth years of study, an increase in the number of respondents with a low level of physical activity prevails. At the same time, such growth is not statistically significant and does not significantly affect the total number of student locomotions. The largest number of students with high level of physical activity were born in a big city. Also, the high level of activity prevails among students who live in their own homes, that is, they did not change their place of residence, entering the university. The chosen profession, with the exception of the Specialty "Physical culture and sports" does not significantly affect the physical activity of students.

Conclusions: It has been established that the training effect has only a high level of physical activity, which includes specially organized physical exercises and intensive sports and mobile games. At the same time, this component of physical activity is available among most students only in the form of compulsory physical education classes. If there are no such classes on a given day, then there is no high level of physical activity. Such a condition does not fully ensure the proper functioning of the youth body.

Key words: higher educational institutions of Ukraine, IPAQ, physical activity, students

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ISBN 978-80-7561-143-7