



Quality of Life

in Interdisciplinary Approach

2nd World Scientific Congress
5-7.11.2019 Kochcice, Poland

Book of Abstracts

Editors

Jacek Wąsik, Janusz Szopa



Jan Długosz University
in Częstochowa



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Stowarzyszenie Jogi Akademickiej



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Table of Contents

Program.....	9
ABSTRACTS.....	15
Serotonin – cultural circumstances of (un)hapiness.....	17
Izabela Kowalczyk	17
Psychological benefits of physical activity in adulthood - overview of studies and examples of good practices	18
Kludia Zusková.....	18
The Influence of Heel Heights on Lower-Limb Motor Control of Female Adults.....	19
Daifeng Yu, Yaguang Yu, Gongbing Shan.....	19
Developing an AI-based Platform to Predict and Prevent Age-Related Falls among Seniors	20
Gongbing Shan, Zhong Zhang.....	20
Research project on the incidence and prevalence of injury in Portuguese soccer players	21
Mário A. Rodrigues-Ferreira, António M. Vences Brito, Nuno Loureiro, Félix Romero.....	21
Relationship between asymmetries in lower limb muscle strength and the impulsion and balance of soccer players	22
Maria António Castro, João Domingues, António M. Vences Brito.....	22
Cognitive functions of female in terms of the type of sport disciplines.....	23
Petra Pačesová, Pavel Šmela, Dagmar Nemček.....	23
The differences in the efficiency of kick-start positions in swimming.....	24
Ivan Matúš, Róbert Kandráč, Pavol Čech, Bibiana Vadašová, Pavel Ružbarský.....	24
Perceived changes in the university student's health behavior after participating in the study on wearing high-heeled shoes.....	25
Miloslav Gajdoš, Soňa Jandová, Rúth Lenková, Bibiana Vadašová, Jakub Čuj, Wioletta Mikul'áková, Pavol Nechvátal,.....	25
Comparison of muscle activity during swimming and on the Biokinetic simulator	26
Jitka Vaněčková, Hana Kabešová.....	26
Physical education in the Czech elementary schools for the deaf: a comparison of differences students' viewing by severity of hearing loss.....	27
Petra Kurková	27
Analysis of the quality of life and the effect of pain on the functioning of patients with spinal diseases.....	28
Dorota Sadowska, Wioletta Łubkowska, Justyna Krzepota	28
Formation of physical actiity motivation at students by method CrossFit.....	29
Olha Kolomiitseva, Ihor Prykhodko, Anna Prikhodko, Ruslan Anatskyi, Artem Turchynov, Serhii Fishev, Svitlana Hunbina, Oleg Garkavyi.....	29
Fitness trends in different countries.....	30

Anastasiia Vorobiova, Maryna Vasylenko	30
Selected aspects of the quality of life of ballroom dancers with spondylosis and osteoarthritis after finishing a sports career	31
Adrianna Banio, Jerzy Eider	31
Taekwon-Do Pedagogy in North Korea: A Case Study	32
John A. Johnson, Wojciech J. Cynarski, Sunjang Lee	32
Characteristics of changes in body structure and composition of future general aviation pilots observed over a period of 10 months	33
Ewa Polak, Adrianna Gardzińska	33
Influence of set-up on the efficacious of Active Breaks Classroom	34
Mohammed Zerf	34
Application of natural language processing (NLP) algorithm for quantitative analysis of martial arts-related papers from Web of Science	35
Dariusz Mosler, Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Karina Wyszomierska	35
Subjective well-being of male and female high school students preferring sedentary leisure activities: a health status differences	36
Dagmar Nemček, Terézia Harčaríková, Petronela Ladecká, Petra Pačesová, Pavel Šmela	36
The quality of life of elite athletes, recreational athletes and non-athletes adolescents	37
Pavel Smela, Petra Pacesova, Juraj Nemcek	37
Problems with diagnosing early stadia of scoliosis due to discrepancies between ATR and the Cobb angle	38
Marek Kluszczyński, Jacek Wąsik, Dorota Ortenburger	38
Influence of psychophysiological features on forming the combat style	39
Nataliia Dakal	39
Cognitive features of highly qualified volleyball players	40
Diana Mishchuk	40
Conditions for the development of recreational and leisure activities for secondary school students	41
Kovalova Nataliia, Omelchenko Tetiana	41
Building functional training activities with the use of elements of Crossfit	42
Kyrychenko Viktoriia, Khurtenko Oksana	42
Motor Performance of Preschool Children with Dyslalia and Normally Developing Preschool Children	43
Miroslava Dobrodinská	43
The assessment of movement competence in Czech school age children using BOT 2 test	44
Šeflová, Iva, Kalfiřt, Luděk	44
The relationship between somatic and motor parameters among school-aged children	45

Erika Chovanová, Mária Majherová	45
Differences in the levels of children's somatic and motor parameters.....	46
Erika Chovanová, Mária Majherová	46
Comparative analysis of addirect forward stroke peromed on single canoe in flatwater canoeing and in paddle pool.....	47
Skopek M, Bacakova R, Bílý M	47
Structure of swimming performance to 50 meters freestyle in a short course.....	48
Natália Kováčová, Zuzana Pupišová, Jaroslav Broďáni, Ľuboslav Šiška	48
Analysis of the associations between balance, laterality, muscle condition and performance in youth alpine skiing category	49
Ivana Turková, Martin Nosek, Josef Heidler	49
Physical fitness and gross motor coordination in relation to weight status in primary school-aged children.....	50
Ingrid Ružbarská.....	50
Education for person with chronic obstructive pulmonary disease: why, what and how to teach?	51
Kateryna Tymruk-Skoropad, Iuliia Pavlova	51
Ukrainian translation, culture adaptation and validation of Fair Play questionnaire in physical education for assessing social skills of children and adolescents.....	52
Iuliia Pavlova	52
Does space matter? Space as a factor influencing recess physical activity.....	53
Magdalena Lelonek, Agnieszka Przychodni	53
Monitoring by garmin forerunner 735xt at rest, walking and running at varying velocities	54
Jan Hnízdl, Štefan Balkó, Martin Škopek.....	54
Correction of basic motor competences of standard population in younger school age.....	55
Iveta Boržíková, Erika Chovanová, Mária Majherová.....	55
Health behaviors as determinants of the quality of life of the elderly	56
Paweł F. Nowak, Cezary Kuśnierz, Daniel Puciato	56
Physical and mental health conditions of the life quality of combatants under treatment and rehabilitation course	57
Anatolii Tsos, Olha Andriichuk, Nataliia Bielikova, Svitlana Indyka, Vasyl Pantik, Liudmyla Vashcuk, Olha Roda.....	57
Awareness of patients with metabolic diseases of the importance of physical activity in treating their disorders	58
Alena Buková, Ján Junger, Agata Horbacz, Zuzana Küchelová.....	58
Sport in Zawiercie in the years 1945-1989	59
Daniel Bakota	59

The effect of physical activity and of regular yoga practicing for sleeping quality, stress reduction and satisfaction of life quality	60
Agnieszka Pluto-Prądyńska, Karolina Pluto-Prądyńska, Grzegorz Dworacki	60
Preliminary indications of yoga effect on NK and T cell count subpopulations in peripheral blood in chronically stressed persons	61
Grzegorz Dworacki, Magdalena Frydrychowicz, Maciej Boruckowski, Agnieszka Pluto-Prądyńska	61
Slavic gymnastic for women – the traditional system of physical activity for health and beauty	62
Agnieszka Pluto-Prądyńska, Mateusz Madejczyk, Magdalena Napieralska, Oksana Pawłowska, Grzegorz Dworacki	62
Slavic gymnastic for women – the workshop	63
Agnieszka Pluto-Prądyńska, Magdalena Napieralska	63
Degree of interest in horse-back riding therapy interventions for patients with neurocognitive disorders: a quantitative analysis of literature in online scientific databases	64
Renata Urban	64
The strategies stress management used by people performing taekwon and patients in chronic low back pain therapy - a pilot study	65
Dorota Ortenburger, Jacek Wąsik , Tomek Góra, Dariusz Mosler, Agata Wójcik	65
Taekwon-do as support for psychophysical condition and development	66
Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Dariusz Mosler	66
"Physical Activity and Health in Interdisciplinary approach" - International Scientific Conferences of Students and PhD Students: activation of the student scientific societies	67
Dorota Ortenburger, Agnieszka Pobratyn, Marek Kluszczyński	67
Goals of interdisciplinary programmes occupational therapy - selected aspects	68
Renata Spalek, Dorota Ortenburger, Jacek Wąsik, Małgorzata Szerla	68
Aesthetic Movement Assessment Scale Research: Concept and Design	69
Mirosław Paweł Górny, Klaudia Zusková	69
The use of the soft stick in sports rivalry supplementing aikido practice	70
Andrzej Mroczkowski	70
Using rotation training simulator for teaching break dance	71
Andrzej Mroczkowski	71
Quality of life of participants of instructor courses in the specialty of hatha yoga	72
Agnieszka Kmiecik, Janusz Szopa	72

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Dear Colleagues and Friends,

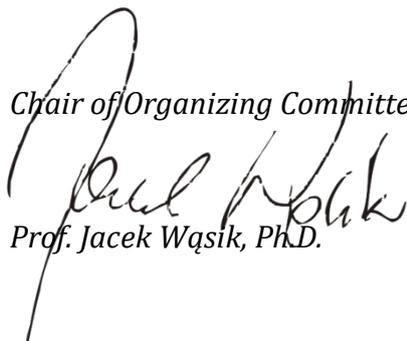
It is our pleasure to welcome you in Kochcice near Częstochowa for the 2nd World Scientific Congress „Quality of Life in Interdisciplinary Approach” .

*I am proud that we have authors from 12 countries: **Korea, Canada, China, Portugal, Sweden, Italy, Czech Republic, Slovakia, Ukraine, Belarus, Algeria and Poland.***

The Conference creates space for communication and exchange of experience within the meaning of the sciences about physical education and health in the interdisciplinary approach. As an Organiser, I would like the conference to become the platform to raise discussion and creating common research plans.

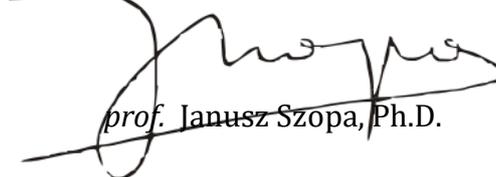
I wish you success during your presentations.

Chair of Organizing Committee



Prof. Jacek Wąsik, Ph.D.

Chairman of Scientific Committee



prof. Janusz Szopa, Ph.D.



Program

5 November 2019

From 14.00	Arrival, accommodation - <i>Strzelnica Family Resort & SPA, ul. Lubliniecka 9, Kochcice, 42-713 Kochanowice</i>
15.30 – 17.30	Social program – Go-kart racing or Sauna, SPA
18.00 – 19.30	Dinner
20.00 – 22.00	Sauna, SPA

6 November 2019

7.30 – 9.00	Breakfast
9.30-9.50	Opening ceremony - Gold Banquet Room
9.50-10.30	<p>Plenary session</p> <p>SEROTONIN - CULTURAL CONDITIONS OF (UN)HAPPINESS prof. Izabela Kowalczyk</p> <p>PSYCHOLOGICAL BENEFITS OF PHYSICAL ACTIVITY IN ADULTHOOD - OVERVIEW OF STUDIES AND EXAMPLES OF GOOD PRACTICES prof. Klaudia Zuskova</p>
10.30-12.00	<p>Session I - Gold Banquet Room <i>Chairmen – prof. Klaudia Zuskova, prof. Izabela Kowalczyk, prof. Wiesław Pilis</i></p> <p>COGNITIVE FUNCTIONS OF FEMALE IN TERMS OF THE TYPE OF SPORT DISCIPLINES Petra Pačesová, Pavel Šmela, Dagmar Nemček</p> <p>THE DIFFERENCES IN THE EFFICIENCY OF KICK-START POSITIONS IN SWIMMING Ivan Matúš, Róbert Kandráč, Pavol Čech, Bibiana Vadašová, Pavel Ružbarský</p> <p>PERCEIVED CHANGES IN THE UNIVERSITY STUDENT'S HEALTH BEHAVIOR AFTER PARTICIPATING IN THE STUDY ON WEARING HIGH-HEELED SHOES Miloslav Gajdoš, Soňa Jandová, Rúth Lenková, Bibiana Vadašová, Jakub Čuj, Wioletta Mikuláková, Pavol Nechvátal</p> <p>COMPARISON OF MUSCLE ACTIVITY DURING SWIMMING AND ON THE BIOKINETIC SIMULATOR Jitka Vaněčková, Hana Kabešová</p> <p>PHYSICAL EDUCATION IN THE CZECH ELEMENTARY SCHOOLS FOR THE DEAF: A COMPARISON OF DIFFERENCES STUDENTS' VIEWING BY SEVERITY OF HEARING LOSS Petra Kurková</p>

	<p>STRUCTURE OF SWIMMING PERFORMANCE TO 50 METERS FREESTYLE IN A SHORT COURSE Natália Kováčová, Zuzana Pupišová, Jaroslav Broďáni, Ľuboslav Šiška</p>
12.00-12.15	Coffee break
10.30-12.00	<p>Session II - Conference Room <i>Chairmen – prof. Oksana Khurtenko, prof. Ingrid Ružbarská, prof. Tsos Anatolii</i></p>
	<p>FORMATION OF PHYSICAL ACTIVITY MOTIVATION AT STUDENTS BY METHOD CROSSFIT Olha Kolomiitseva, Ihor Prykhodko, Anna Prikhodko, Ruslan Anatskyi, Artem Turchynov, Serhii Fishev, Svitlana Hunbina, Oleg Garkavyi</p> <p>FITNESS TRENDS IN DIFFERENT COUNTRIES Anastasiia Vorobiova, Maryna Vasylenko</p> <p>COMPARATIVE ANALYSIS OF ADDIRECT FORWARD STROKE PERFORMED ON SINGLE CANOE IN FLATWATER CANOEING AND IN PADDLE POOL Skopek M, Bacakova R, Bílý M</p> <p>SELECTED ASPECTS OF THE QUALITY OF LIFE OF BALLROOM DANCERS WITH SPONDYLOSIS AND OSTEOARTHRITIS AFTER FINISHING A SPORTS CAREER Adrianna Banio, Jerzy Eider</p> <p>QUALITY OF LIFE OF PARTICIPANTS OF INSTRUCTOR COURSES IN THE SPECIALTY OF HATHA YOGA Agnieszka Kmiecik, Janusz Szopa</p> <p>DOES SPACE MATTER? SPACE AS A FACTOR INFLUENCING RECESS PHYSICAL ACTIVITY Magdalena Lelonek, Agnieszka Przychodni</p>
12.00-12.15	Coffee break
12.15-13.45	<p>Session III - Gold Banquet Room <i>Chairmen – prof. Rút Lenková, prof. Iuliia Pavlova, prof. Kuśnierz Cezary</i></p>
	<p>PROBLEMS WITH DIAGNOSING EARLY STADIA OF SCOLIOSIS DUE TO DISCREPANCIES BETWEEN ATR AND THE COBB ANGLE Marek Kluszczyński, Jacek Wąsik Dorota Ortenburger</p> <p>SLAVIC GYMNASTIC FOR WOMEN – THE TRADITIONAL SYSTEM OF PHYSICAL ACTIVITY FOR HEALTH AND BEAUTY Agnieszka Pluto-Prądkyńska, Mateusz Madejczyk, Magdalena Napieralska, Oksana Pawłowska, Grzegorz Dworacki</p>

APPLICATION OF NATURAL LANGUAGE PROCESSING (NLP)
ALGORITHM FOR QUANTITATIVE ANALYSIS OF MARTIAL ARTS-
RELATED PAPERS FROM WEB OF SCIENCE
Dariusz Mosler, Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Karina
Wyszomierska

COGNITIVE FEATURES OF HIGHLY QUALIFIED VOLLEYBALL PLAYERS
Diana Mishchuk

THE QUALITY OF LIFE OF ELITE ATHLETES, RECREATIONAL
ATHLETES AND NON-ATHLETES ADOLESCENTS
Pavel Smela, Petra Pacesova, Juraj Nemcek

INFLUENCE OF PSYCHOPHYSIOLOGICAL FEATURES ON FORMING THE
COMBAT STYLE
Nataliia Dakal

14.00-15.00 **Lunch**

12.15-13.45 **Session IV - Conference Room**

Chairmen –prof. Erika Chovanowa, prof. Vasylenko Maryna,

SUBJECTIVE WELL-BEING OF MALE AND FEMALE HIGH SCHOOL
STUDENTS PREFERRING SEDENTARY LEISURE ACTIVITIES: A
HEALTH STATUS DIFFERENCES
Dagmar Nemček, Terézia Harčaríková, Petronela Ladecká, Petra
Pačesová, Pavel Šmela

CONDITIONS FOR THE DEVELOPMENT OF RECREATIONAL AND
LEISURE ACTIVITIES FOR SECONDARY SCHOOL STUDENTS
Kovalova Nataliia, Omelchenko Tetiana

MOTOR PERFORMANCE OF PRESCHOOL CHILDREN WITH DYSLALIA
AND NORMALLY DEVELOPING PRESCHOOL CHILDREN
Miroslava Dobrodinská

THE ASSESSMENT OF MOVEMENT COMPETENCE IN CZECH SCHOOL
AGE CHILDREN USING BOT 2 TEST
Šeflová, Iva, Kalfiřt, Luděk

PHYSICAL FITNESS AND GROSS MOTOR COORDINATION IN RELATION
TO WEIGHT STATUS IN PRIMARY SCHOOL-AGED CHILDREN
Ingrid Ružbarská

UKRAINIAN TRANSLATION, CULTURE ADAPTATION AND
VALIDATION OF FAIR PLAY QUESTIONNAIRE IN PHYSICAL
EDUCATION FOR ASSESSING SOCIAL SKILLS OF CHILDREN AND
ADOLESCENTS
Iuliia Pavlova

14.00-15.00	Lunch
15.00-15.45	Session V - Conference Room <i>Chairmen – prof. Olha Kolomiitseva, prof. Mária Majherová, prof. Zbigniew Borysiuk</i>
	<p>MONITORING BY GARMIN FORERUNNER 735XT AT REST, WALKING AND RUNNING AT VARYING VELOCITIES. Jan Hnízdl, Štefan Balkó, Martin Škopek</p> <p>ANALYSIS OF THE ASSOCIATIONS BETWEEN BALANCE, LATERALITY, MUSCLE CONDITION AND PERFORMANCE IN YOUTH ALPINE SKIING CATEGORY Ivana Turková, Martin Nosek, Josef Heidler</p> <p>CORRECTION OF BASIC MOTOR COMPETENCES OF STANDARD POPULATION IN YOUNGER SCHOOL AGE Iveta Boržíková, Erika Chovanová, Mária Majherová</p> <p>THE USE OF THE SOFT STICK IN SPORTS RIVALRY SUPPLEMENTING AIKIDO PRACTICE Andrzej Mroczkowski</p> <p>USING ROTATION TRAINING SIMULATOR FOR TEACHING BREAK DANCE Andrzej Mroczkowski</p>
16.00-17.00	Workshop Slavic Gymnastic for Women Agnieszka Pluto-Prądyńska, Magdalena Napieralska
17.00-18.00	Workshop Yoga Janusz Szopa
16.00-18.30	Posters Session - Gold Banquet Room <i>Chairmen – prof. Jerzy Eider, prof. Renata Urban, prof. Jacek Wąsik</i>
	<p>THE EFFECT OF PHYSICAL ACTIVITY AND OF REGULAR YOGA PRACTICING FOR SLEEPING QUALITY, STRESS REDUCTION AND SATISFACTION OF LIFE QUALITY Agnieszka Pluto-Prądyńska, Karolina Pluto-Prądyńska, Grzegorz Dworacki</p> <p>EDUCATION FOR PERSON WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: WHY, WHAT AND HOW TO TEACH? Kateryna Tymruk-Skoropad, Iuliia Pavlova</p> <p>PRELIMINARY INDICATIONS OF YOGA EFFECT ON NK AND T CELL COUNT SUBPOPULATIONS IN PERIPHERAL BLOOD IN CHRONICALLY STRESSED PERSONS Grzegorz Dworacki, Magdalena Frydrychowicz, Maciej Boruczkowski, Agnieszka Pluto-Prądyńska</p>

INFLUENCE OF SET-UP ON THE EFFICACIOUS OF ACTIVE BREAKS
CLASSROOM

Mohammed Zerf

SPORT IN ZAWIERCIE IN THE YEARS 1945-1989

Daniel Bakota

TAEKWON-DO PEDAGOGY IN NORTH KOREA: A CASE STUDY

John A Johnson, Wojciech J Cynarski, Sunjang Lee

THE RELATIONSHIP BETWEEN SOMATIC AND MOTOR PARAMETERS
AMONG SCHOOL-AGED CHILDREN

Erika Chovanová, Mária Majherová

DIFFERENCES IN THE LEVELS OF CHILDREN'S SOMATIC AND MOTOR
PARAMETERS

Erika Chovanová, Mária Majherová

PHYSICAL AND MENTAL HEALTH CONDITIONS OF THE LIFE QUALITY
OF COMBATANTS UNDER TREATMENT AND REHABILITATION
COURSE

Anatolii Tsos, Olha Andriichuk, Nataliia Bielikova, Svitlana Indyka,
Vasyl Pantik, Liudmyla Vashcuk, Olha Roda

AWARENESS OF PATIENTS WITH METABOLIC DISEASES OF THE
IMPORTANCE OF PHYSICAL ACTIVITY IN TREATING THEIR
DISORDERS

Alena Buková, Ján Junger, Agata Horbacz, Zuzana Küchelová

HEALTH BEHAVIORS AS DETERMINANTS OF THE QUALITY OF LIFE
OF THE ELDERLY

Paweł F. Nowak, Cezary Kuśnierz, Daniel Puciato

DEGREE OF INTEREST IN HORSE-BACK RIDING THERAPY
INTERVENTIONS FOR PATIENTS WITH NEUROCOGNITIVE
DISORDERS: A QUANTITATIVE ANALYSIS OF LITERATURE IN ONLINE
SCIENTIFIC DATABASES

Renata Urban

THE STRATEGIES STRESS MANAGEMENT USED BY PEOPLE
PERFORMING TAEKWON AND PATIENTS IN CHRONIC LOW BACK
PAIN THERAPY- A PILOT STUDY

Dorota Ortenburger, Jacek Wąsik, Tomek Góra, Dariusz Mosler, Agata
Wójcik

AESTHETIC MOVEMENT ASSESSMENT SCALE RESEARCH: CONCEPT
AND DESIGN

Mirosław Paweł Górny, Klaudia Zusková

SPORTS FOR THE DISABLED IN POLAND IN THE 1970S

Arkadiusz Płomiński

TAEKWON-DO AS SUPPORT FOR PSYCHOPHYSICAL CONDITION AND DEVELOPMENT

Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Dariusz Mosler

PHYSICAL ACTIVITY AND HEALTH IN INTERDISCIPLINARY APPROACH"- INTERNATIONAL SCIENTIFIC CONFERENCES OF STUDENTS AND PHD STUDENTS: ACTIVATION OF THE STUDENT SCIENTIFIC SOCIETIES

Dorota Ortenburger, Agnieszka Pobratyn, Marek Kluszczyński

DEVELOPING AN AI-BASED PLATFORM TO PREDICT AND PREVENT AGE-RELATED FALLS AMONG SENIORS

Gongbing Shan, Zhong Zhang

THE INFLUENCE OF HEEL HEIGHTS ON LOWER-LIMB MOTOR CONTROL OF FEMALE ADULTS

Daifeng Yu, Yaguang Yu, Gongbing Shan

RELATIONSHIP BETWEEN ASYMMETRIES IN LOWER LIMB MUSCLE STRENGTH AND THE IMPULSION AND BALANCE OF SOCCER PLAYERS

Maria Ant3nio Castro, Jo3o Domingues, Ant3nio M. VencesBrito

RESEARCH PROJECT ON THE INCIDENCE AND PREVALENCE OF INJURY IN PORTUGUESE SOCCER PLAYERS

M3rio A. Rodrigues-Ferreira, Ant3nio M. VencesBrito, Nuno Loureiro, F3lix Romero

CHARACTERISTICS OF CHANGES IN BODY STRUCTURE AND COMPOSITION OF FUTURE GENERAL AVIATION PILOTS OBSERVED OVER A PERIOD OF 10 MONTHS

Ewa Polak, Adrianna Gardzińska

BUILDING FUNCTIONAL TRAINING ACTIVITIES WITH THE USE OF ELEMENTS OF CROSSFIT

Kyrychenko Viktoriia, Khurtenko Oksana

ANALYSIS OF THE QUALITY OF LIFE AND THE EFFECT OF PAIN ON THE FUNCTIONING OF PATIENTS WITH SPINAL DISEASES

Dorota Sadowska, Wioletta Łubkowska, Justyna Krzepota

18.30-2.00

Gala Dinner - Gold Banquet Room

7 November 2019

8.00-10.00

Breakfast

10.00-10.30

Closing ceremony

ABSTRACTS

Serotonin – cultural circumstances of (un)happiness

Izabela Kowalczyk

University of Arts In Poznan, Poland

In the latest book by Michel Houellebecq “Serotonin” (2019), the main protagonist as he gets older loses all the joy of life. He is lonely, quits his job, in the meantime his only friend dies, he no longer feels a bit of desire. His body has very high levels of cortisol, known as the hormone of stress and sadness, and there is a lack of serotonin.

The latter, called the hormone of happiness is a chemical compound secreted in the hypothalamus and is one of the neurotransmitters, it is formed by the breakdown of tryptophan. It is responsible for digestive functions, good sleep and well-being. Serotonin levels are increased due to, among others relaxation, physical activity, eating chocolate and products containing vitamin B, as well as thanks to sex and kisses. Excess serotonin, although it is also not indicated, occurs in people who are in love.

In this paper I want to think about whether an approach to corporality, sexuality, pleasure, but also our transience rooted in European culture; does not condemn us to the fact that, like the protagonist of Houellebecq’s book, we suffer from a deficiency of the happiness hormone. We mortify or punish our own body, we enjoy it too rarely, we live in constant stress, chasing after money, power or even points for scientific achievements. Perhaps, however, in contemporary, no longer homogeneous culture, in which such elements as fascination with the East culture, slow life current, as well as post-humanist calls for recomposition of subjectivity and community (Rosi Braidotti) appear, can we find recipes for happiness and good life?

Keywords: happiness, contemporary culture, body, serotonin

Psychological benefits of physical activity in adulthood - overview of studies and examples of good practices

Klaudia Zusková

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In the last century, there has been substantial scientific research to address both the issue of physical activity (PA) - exercise and sports - to reduce stress, anxiety, and depression, and the benefits of exercise in cognitive functioning. Positive psychology is currently at the forefront of scientific research. In turn, it influences the direction of research in the field of PA and mental health. The positive psychology research is trying to answer the question of what makes a person satisfied and happy. This falls under the topic of subjective quality of life (SQOL), addressed also by international nongovernmental organizations and national governments. PA, as an aspect of human life, is an integral part of SQOL. The extent to which exercise and sports are direct or mediating factors of subjective well-being – an indicator of SQOL - is not yet clear. In today's society, we see a confluence of generations who have grown up physically active interacting with generations who have grown up with a hypokinetic lifestyle. The article deals with the importance of integrating the research and practice within an interdisciplinary approach to solving the issue of psychological and social importance of PA. It covers all ages of adulthood, including seniors. The author presents findings from grant research in which she participated with a focus on the social and psychological aspects of the common sport activity of parents and children - in other words young and middle-aged adults. Furthermore, the grant research addresses selected risk factors for obesity and PA of university students in younger adulthood and motor, social and mental aspects of PA of seniors. In parallel, the paper presents the author's personal experience and good practice on relevant topics. The conclusion points out the importance of looking at case and longitudinal studies in the psychology of exercise, as well as the co-occurrence of generational studies.

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Keywords: exercise psychology, subjective quality of life, life satisfaction, adults, seniors

The Influence of Heel Heights on Lower-Limb Motor Control of Female Adults

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Young women like heel shoes. Especially, for the models, they prefer very high heel shoes for their fashion show. However, always wearing heel shoes can bring damage to feet. The objective of this study aims to explore how shoes with different heel-heights to affect female gait characteristics and motor function of lower limbs. Video-based 3D motion analysis and EMG measurement were applied to the gait test of 12 female models wearing shoes with 0cm, 3cm, 6cm, 10cm, and 18cm heels. The results revealed: 1) When being barefoot and wearing the flat shoes, the models had the longest stride length, and the step length decreased with the increase of the heel height. 2) Walking with flat shoes, the subjects kept their COG (center of gravity) highly stable; with the increase of the heel height, the COG experienced larger ROM (range of motion) in the vertical and lateral directions. 3) The gait with flat shoes had the smallest variation in the hip angle; while, with the increase of the heel height, the ROM of knee and ankle angle decreased. 4) EMG mean power frequency (MPF) indicated that the activities of gastrocnemius and soleus were the highest, and time-domain analysis suggested that the activities of biceps femoris and soleus increased most with the increase of heel height. In conclusion, the negative influence of heel height on female gait would appear when the heel height is larger than 6 cm.

Keywords: motor control, EMG, heel height, female

Developing an AI-based Platform to Predict and Prevent Age-Related Falls among Seniors

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Early identification of individuals with impaired balancing ability could lead to timely interventions and reduce the hazard of age-related falls among seniors. Numerous methods for researching the prevention of falls and age-related sensori-motor degradation have been proposed and tested. Most are either too expensive for practitioners or too physically demanding to use with seniors. A simple, reliable technique is desired. The aim of our study is to develop a practical and quantitative solution for assessment of age-related degradation of human sensori-motor function, which could in turn serve as a means of fall prevention among seniors. An AI-based platform, the Dynamic Balance Testing Platform, was developed. The design includes AI models to address the non-linearity and redundancy in the neural network that controls sensori-motor functions. 169 subjects aged from 18 to 86 years were tested using the proposed method. Results showed that 1) the novel device did reflect the sensori-motor degradation related to age, 2) reliable evaluation of sensori-motor function needs not be complicated, time consuming or costly, and 3) the developed equipment powered with AI technology holds great potentials for predicting fall possibility. Overall, this study validated a strategy of fall prevention with a potential for prevalent use in the healthcare industry.

Keywords: seniors, prevent falls, Dynamic Balance Testing Platform

Research project on the incidence and prevalence of injury in Portuguese soccer players

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The knowledge and study of the traumatic components of sports practice, specifically those that can be typified in soccer, may lead to more appropriate and preventive training methodologies regarding injury, which will increase the athletic performance and health status of the soccer player. Efforts are needed to prevent and control injuries in soccer players, especially those that may impede participation in the game and other physical activities for extended periods of time, to ensure the health and safety of participants. Therefore, the aim of this research project will be to characterize and typify the most common injuries and their incidence, in soccer practice, in groups differentiated by gender, field position, age group, maturity and competitive level.

The study will take place during this sport season and the participants will be volunteers and the inclusion criterion will be to have three or more years of sport practice. In this retrospective study will be applied a questionnaire of morbidity, in which participants will record their demographic data and injury episodes occurred in the last three sport seasons, according to six dimensions (type of injury, anatomical location, mechanisms of injury, severity, time of occurrence in the sport season and type of activity). Sports injury is defined as any symptom of musculoskeletal pain and/or affection resulting from training or sport competition (friendly and official) enough to cause changes and consequent stopping and impairment of the sport for at least one day, after the occurrence of the impairment.

Knowing the incidence and prevalence of injuries in Portuguese soccer and identifying the injury profile of male and female players, will allow the definition of strategies to improve the training process, leading to a preventive intervention with the athletes themselves, coaches and the entities responsible for the promotion and development of the sport.

Keywords: Injury, football, soccer, traumatology.

Relationship between asymmetries in lower limb muscle strength and the impulsion and balance of soccer players

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Lower limb asymmetries in soccer have been identified as potential risk for injuries but their relationship with balance and vertical impulsion is poorly explored.

The aim is to identify bilateral and unilateral asymmetries and their relationship with balance and jump impulsion.

The protocol consisted of collecting data on the maximum concentric force moment at 60°/s, 180°/s and 300°/s, in the Biodex System 3. The test was performed bilaterally. Then the Y-balance test was performed for the three test directions (anterior, posteromedial and posterolateral) and the maximum range reached by the athlete in each direction was recorded. Subsequently, three jumps were performed on the force platform and the athlete's flight time was recorded.

Eleven senior soccer players from different teams volunteered for the study. Age: 21.91 ± 3.14 years; weight: 73.45 ± 7.59 Kg; height: 178.91 ± 8.02 cm; BMI: 22.97 ± 2.12Kg/m².

Strength, vertical impulsion and balance were evaluated for all athletes. The bilateral deficit between the dominant lower limb and the non-dominant lower limb for the quadriceps and hamstrings, and the hamstring/quadriceps (I/Q) ratio for each lower limb was also calculated.

Peak Force, Peak force ratio I/Q, bilateral Peak force asymmetry, the maximum distance obtained in anterior, posteromedial and posterolateral directions, and in flight time.

No statistically significant differences between dominant and non-dominant peak force were found. Bilateral asymmetries of lower limb strength are normal (<15%). The conventional I/Q ratio values are similar to literature. No relationship between bilateral asymmetry of lower limb strength, balance and impulsion was found at any angular velocity. The same was true for unilateral force asymmetries, equilibrium and impulsion.

In conclusion, no statistically significant differences between bilateral and unilateral asymmetries of lower limb forces, balance and impulsion were found.

Keywords: Soccer; muscle strength; injury; football

Cognitive functions of female in terms of the type of sport disciplines

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Introduction. The cognitive functions usable in the sports performance are for example an ability to anticipate, perception and speed of movement reactions, decision-making ability or attention. These abilities or functions apply differently to different sports. It means that open skill sports such as team sport games, require the coordination of complex bodily movements and adaptation to continually changing task demands. The aim of this study is to identify differences in the level of female's cognitive functions regarding the individual and team sport disciplines. **Material and Methods.** The research group consisted of 84 healthy women aged 22.70 ± 1.71 years. Women were divided into three groups in terms of realized sport discipline into: female engaged in individual sport disciplines ($n=26$), female engaged in team sport disciplines ($n=19$) and female not engaged in any sport activity ($n=39$). We used standardized S-test to determine the level of cognitive functions. It is a test of spatial orientation and concentration of attention with accentuated demands on the pace of activity. To obtain the results we used the non-parametric Kruskal-Wallis test followed by the post hoc Mann-Whitney test. **Results.** The results have shown that female engaged in team sport disciplines have shown higher level of cognitive functions than female engaged in individual sport disciplines ($p=0.04$) and also as nonathletes ($p=0.02$). There was no difference in cognitive function between female engaged in individual sport disciplines and nonathletes. **Conclusions.** Our results confirm the theory of different involvement of cognitive functions from the point of view of different types of sport disciplines.

Keywords: concentration of attention, spatial orientation, individual sport disciplines, team sport disciplines

The differences in the efficiency of kick-start positions in swimming

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Introduction: With the introduction of the OSB12 starting plate, swimmers need to quickly modify and adjust their techniques to take advantage of the new swimming start plate during normal training.

Methodology: The purpose of the study was to determine the differences in the efficiency of kick-start positions from the OSB12 in swimming. The sample included eight developmental level swimmers with the average age of 17.1 ± 1.8 . Swimmers performed starts from the OSB12 starting block from three stances, front-weighted, neutral-weighted, and rear-weighted, across all 5 kick plate positions. The kinematic parameters measured were block time, flight time, glide time, time to 2 m, time to 5 m, knee angle, hip angle, take-off angle, entry angle, flight distance, and glide distance.

Results: Rear-weighted kick start showed longer block time, flight distance, and time to 2 meters compared to other stances. Results showed that the neutral and rear-weighted positions produced faster times to 5 m ($p < .05$) when compared to the front-weighted position. The swimmers produced faster times to 5 meters when the front and rear knee angles across all 5 five kick plate positions ranged from 130° and 133° and from 76° to 80° , respectively.

Conclusion: According to the results of the study, young developmental swimmers should start from the neutral-weighted and rear-weighted positions on the OSB11 and OSB12 starting blocks. Further research is to be conducted to determine the effect of foot and leg positioning on the time parameters.

The study was supported by project VEGA 1/0997/16 "The effect of basic position on the starting block on changes in kinematic parameters of track start in swimming".

Keywords: OSB12, kinematic parameters, young swimmers

Perceived changes in the university student's health behavior after participating in the study on wearing high-heeled shoes

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Objectives: Wearing high-heeled shoes (HH) is a wide-spread practice among Western women, maintaining popularity despite its harmful potential. We examined the main motivation behind wearing HH in female students, as well as the possible change to wearing HH among the research participants. **Methods:** Thirty university students (N=30 females, age 21.8±2.09 years; weight: 55.7±4.05 kg, height: 1.66±0.03 m, BMI: 20.34±1.41 kg.m⁻², shoe size: EU 36–38), who commonly wear HH to work or for social events participated in the study. We are dealing with this issue within the framework of the Vega grant project no. 1/0376/19 "Risk factors of health of university students in physical activity". The SonoSens Monitor Analyzer system (Gefremed, Chemnitz, Germany) was used to observe participants' posture when walking and movements in individual sections of their spines. In a comparative experiment, the correlation between variables recorded when walking in two types of shoes was identified. The first pair of shoes (HH) had 7 cm heels whereas the second were flat sport shoes (FS). **Results:** The evaluation of participants' spines and posture when walking in HH and FS revealed significant differences (p<.05). The evaluation of the initial and follow-up surveys indicates that the main motivation for wearing HH among the test group was to increase their attractiveness and respond to social expectations. After participating in the research and becoming aware of its outcomes and issues, the test group's attitude to wearing HH has changed. **Conclusions:** In regards to good posture and spinal health, this study has raised some awareness amongst its participants, and has therefore proved to be a significant positive influence.

Keywords: high heeled shoes; attractiveness; women; harmful impact; posture

Comparison of muscle activity during swimming and on the Biokinetic simulator

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The aim of the study is to evaluate the coordination similarity ratio of involvement of selected muscles during the crawl swimming cycle as a target movement with imitation movement act. The decisive method of research was surface electromyographic analysis synchronized with video recording. The study was based on a quantitative description of electromyographic recordings of the observed movement acts. The research study has the character of an intra-individual and inter-individual comparative analysis of the coordination characteristics of the movement system. This is a sequential triangulation of a quantitative-qualitative approach and an intragroup case study with an experimental way of getting data. Muscle activation of selected muscles during the crawl did not show a significant difference in effect size compared to the imitation movements on the Biokinetic swimming simulator.

Keywords: Biokinetic, surface electromyography, swimming, swimming simulator,

Physical education in the Czech elementary schools for the deaf: a comparison of differences students' viewing by severity of hearing loss

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Physical education is a very important discipline since it helps on the development of students' cognitive abilities and motor skills. Thus, physical education may be the best setting for individuals who are deaf or hard of hearing to learn about physical activity and healthy life style. The purpose of this study was to analyze differences in students' viewing by degree of hearing loss in the second grade of elementary schools for the deaf or hard of hearing in physical education classes. Participants were 86 students who are deaf or hard of hearing (severe to profound hearing loss, $n = 51$; 59.3%); an average age of 14.3 ± 1.4 years. The data were described using absolute and relative frequencies, including the mean and standard deviation. The non-parametric Mann-Whitney U-test, Kruskal-Wallis test, Fisher test, Chi-square test and Bonferroni post hoc tests were used for statistical analyses. For calculation of effect size coefficient $abs(r)$ was used. All tests were performed at a level of $\alpha = 0.05$. Physical education is more popular in students with severe hearing loss (a very popular subject, $n = 27$; 52.9%; $Z = -2.409$; $p = 0.016$; $abs(r) = 0.260$). In the Emotionality 2 indicator, statistical significance was confirmed by the effect size mean coefficient ($abs(r) = 0.175$). However, statistical significance was not confirmed.

The severity of hearing loss has no negative effect on opinions or feelings in physical education classes. Students with severe hearing loss are more fond of physical education and consider it less demanding, they make more effort, and rate their feelings better. Also, these students are disappointed when a physical education lesson is cancelled.

Keywords: physical education, special education, deaf and hard of hearing, hearing loss

Analysis of the quality of life and the effect of pain on the functioning of patients with spinal diseases

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Aim. This study assessed the quality of life and the effect of pain on the functioning of patients with spinal pain.

Material and methods. The study included 126 patients with spinal diseases aged from 20 to 90 years. The tools used in the study were the WHOQoL-Bref (Wołowicka, Jaracz 2001) for the assessment of the quality of life and the Visual Analog Scale (VAS) by Barbara Headley (2001) for the assessment of the effect of pain on functioning of patients.

Results. The participants rated their general perception of the quality of life at 3.9, whereas their general self-rated health - at 3.4. The lowest assessment was found for the physical domain of the quality of life (15.0 ± 2.6). More than half of the patients (50.8%) rated their spinal pain as moderate, 9.5% - as severe, and 1.6% - as maximum. Furthermore, 28.6% of the respondents declared that they felt mild pain, and only 5.6% of the patients felt no spinal pain. Nearly 40% of the respondents declared that pain disturbed their daily activity to a moderate degree. As many as 44.4% of patients experienced moderate pain in the sitting position, whereas 33.3% of patients complained about moderate to severe pain during walking. Nearly 70% of patients had to re-organize their professional and household duties due to pain. The analysis of the relationships between the WHOQoL-Bref and the the VAS scale showed the strongest correlation between the general perception of the quality of life and limitations to the performance of domestic duties caused by pain ($R=0.44$; $p \leq 0.001$).

Conclusions. Spinal pain has a negative effect on the quality of life of patients and, above all, it reduces their quality of life in the physical functioning domain. The feeling of pain makes it difficult to perform normal household and professional activities and requires changes in the performance of the activities of daily living. With the increase in pain, the general perception of the quality of life of patients decreases significantly.

Keywords: quality of life, spinal pain, WHOQoL-Bref, VAS scale

Formation of physical activity motivation at students by method CrossFit

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The aim of the study was to evaluate the effectiveness of using CrossFit to increase the level of physical conditions (PC) of students and to form motivation of physical activity (PA).

Participants were 60 male (17-18 years). For 12 weeks, students of the experimental group were exercising according to CrossFit system (two classes a week). The workout included: preparatory part – 20 minutes; the main part – Crossfit (WOD), consisting of five exercises; the final part – stretching. Each exercise was performed for 60s with a rest interval of 60s. Students performed three such series. The amount of PA was varied. Among the students of the experimental group, a survey was conducted with the aim to identify motivation to CrossFit exercises.

Results. Positive changes occurred in the experimental group. The sit-up index increased by 17.9%, a significant increase was noted in “jumping with rope” – 29.07%. An average of 16.3% increase was recorded in the exercises “push-up” and “squat”. In the exercise “burpee” the result increased by 29.52%. From the motives that encouraged students to exercise Crossfit the dominant was the novelty and modernity of the system, the dynamic pace of exercise, acquiring of new motor actions, body shaping, a real improvement in PC, the development of volitional and communication skills, increased self-confidence.

Conclusions. A study based on the Crossfit workout revealed positive changes in the level of PC of students, motivation of PA. In the process of physical education students of the experimental group learned to apply new methods of physical development, master new exercises, methods of load dosing, overcome tiredness to achieve the goal, expanded the range of their own capabilities and increased the threshold of strength and speed-strength abilities.

Keywords: physical activity, CrossFit, motivation, students

Fitness trends in different countries

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The fitness industry is one of the most profitable in the world and attractive for investing. Each fitness center or club try to be in trend and propose for clients the latest and modern kinds of fitness. The purpose of our study is to compare the world fitness trends with national trends in different countries.

Comparison of world and national (the USA, China, Spain) trends of 2018 made it possible to find that global trends reflect USA trends on 95 % (only one direction, which occupies the 20th position, does not correspond with the world trends) and only half of the trends of other represented countries. This is due to the fact that in a study of American College of Sports Medicine from representatives of 41 countries - 91.3 % of respondents from the United States. This fact confirms the need to study national trends, rather than focus on "world" trends, as they reflect the prospects of development, mainly in one country (USA). This statement is true for the fitness trends 2019 on example of research in Spain where again only 60 % of trends equal with the results of the world ranking. We also compare world fitness trends 2019 and national fitness trends of Ukraine, where 80 % of trends are equal, but absolutely in another order. Even comparing the level of fitness development in megapolises and small towns could show a huge difference inside the country. So, we propose to intensify researches in different countries for estimation national trends.

Keywords: fitness; trend; development; perspective; world trends; national trends.

Selected aspects of the quality of life of ballroom dancers with spondylosis and osteoarthritis after finishing a sports career

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Professional sports are characterized by an increased prevalence of many diseases typical of a given discipline that hinder the functioning of athletes after ending their career. The technique of ballroom dancing enforces non-physiological positions, during which compensatory patterns are created, leading to biomechanical disorders, destruction of the articular cartilage and, as a consequence, degenerative changes. People who practice competitive dancing start their career very early, i.e. at the age of five/seven. Perfection to which they aspire requires from them an above-average flexibility, strength and endurance. Habitual repetition of the same movements that exceed one's physiological range and distort muscle flexibility, bending of the body that deepens faulty posture, strong pressure on the lower limbs, wearing high-heeled shoes, fanciful dance figures and body positions, too exhausting workouts, very little time to regenerate, ignoring pain and getting used to it, result in dance being a highly injury prone discipline. Therefore, it can be said that skeletal system disorders can almost be considered occupational diseases of dancers. Chronic diseases of this system, such as spondylosis and osteoarthritis, combined with pain and mobility disorders, have a significant impact on the quality of life of these people. Therefore, the aim of the study was to assess selected aspects of quality of life and the impact of ailments caused by degenerative diseases of ballroom dancers after ending a sports career.

The test material consisted of 48 former dancers diagnosed with degenerative changes, whose dance career lasted an average of 15 years. The study was conducted applying the in-depth interview method, the questionnaire survey as well as the Functional Movement Screen test (FMS). Seven tests evaluating movement patterns were performed. The tests required balance, mobility, flexibility and stabilization of the respondents. This allowed distinguishing the weakest links in the kinematic chain.

The dominant symptom accompanying degenerative changes of the spine and joints was pain, especially in the lumbar-sacral and cervical spine and the knee and hip joints, as well as mobility disorders. The respondents were slightly limited by ailments in their professional duties and daily activities. The biggest biobehavioral problem that accompanied them every day was the feeling of helplessness concerning pain. Nevertheless, longstanding training rigor made them ignorant of pain and taught them to accept it. It is a pathology that has a negative impact on the nervous system and homeostasis of the whole organism.

Keywords: ballroom dancing, quality of life, spondylosis, osteoarthritis, biomechanics

Taekwon-Do Pedagogy in North Korea: A Case Study

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Background. Notwithstanding the fact that the style of Taekwon-Do taught by the International Taekwon-Do Federation (ITF) was inaugurated in the Republic of Korea (ROK; South Korea) during the 1950s and 60s by ROK Army General Choi Hong Hi, that style is known predominately around the world as the Taekwon-Do practiced in the People's Democratic Republic of Korea (DPRK; North Korea). **Problem and Aim.** General Choi introduced Taekwon-Do to the DPRK in 1980. Since then, no academic studies on Taekwon-Do as it is practiced in the DPRK have been conducted. This preliminary study aims to establish if there are differences in pedagogical style and purpose of Taekwon-Do as practiced in the DPRK. **Methods and Materials.** A descriptive, non-experimental case study of one subject (Singaporean female; aged 36 yr.) who thrice travelled specifically to the DPRK to practice Taekwon-Do was conducted. A systematic literature review of ITF pedagogical materials was performed, and a multipurpose, qualitative questionnaire was implemented. The "Composition of Taekwon-Do" was identified as the ITF's intended physical curriculum, and the Stratified Taekwon-Do Pedagogy was used to explain how a method of self-defense can be used for personal and societal development. Qualitative analysis of the questionnaire's data and follow-up interviews were performed. **Results.** Evidence of both the "Composition of Taekwon-Do" and the Stratified Taekwon-Do Pedagogy were found in the subject's Taekwon-Do practice in North Korea illustrating all five areas of the ITF's curriculum and the three levels of Taekwon-do's pedagogy may be present in DPRK Taekwon-Do practice. **Conclusions.** Despite its limitations, this study indicates Taekwon-Do is taught in the DPRK for self-cultivation and societal improvement purposes as General Choi intended.

Keywords: taekwon-do, pedagogy, North Korea

Characteristics of changes in body structure and composition of future general aviation pilots observed over a period of 10 months

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Introduction: Advanced and specific technical knowledge, excellent health as well as above-average physical fitness are required from people working as pilots in general aviation. The aim of the presented study was to determine whether the structure and selected body composition parameters of the examined men meet the health standards and what was the nature of the changes observed after a period of 10 months.

Method: The study was performed in a group of 58 students of the Rzeszów University of Technology who study aviation and astronautics with a specialization in pilotage. The average age of the examined men was 22.1 ± 0.96 years, and the average body height was 181.7 ± 5.72 cm. Body composition was assessed by the bioelectrical impedance analysis (BIA) and was made twice with an interval of 10 months: in January and October 2018. Analyzing the results, basic descriptive statistics and percentage distributions were calculated for body mass values and selected indicators characterizing body composition: FFM, BMI, Fat%, VFatL and MetaAge. The parametric t-student test for dependent samples ($p < 0.05$) was used to determine the significance of differences between measurements.

Results: Analysis of the results obtained in the first measurement showed that a high percentage of subjects exceeded the health standards, determining the allowable amount of body fat. Overweight or obesity determined on the basis of the BMI index was found in 39.73% of the subjects, and on the basis of the Fat% index in 27.58% of the subjects. When determining body type using the PhysioRate indicator, 20.69% of respondents were considered obese. After 10 months, the value of the analyzed indicators increased in a statistically significant percentage of the subjects (from 39.66% to 70.69%). Their body weight increased from 80.5 ± 15.6 kg to 81.7 ± 16.4 kg, BMI from 24.4 ± 4.15 to 24.7 ± 4.46 , Fat% from 16.9 ± 6.54 to $17.3 \pm 7.14\%$, and MetaAge from 21 ± 9.3 to 22 ± 10.3 . The values of the FFM index also increased from 66.1 ± 7.89 to 66.6 ± 7.91 kg, suggesting that not all subjects gained weight due to an increase in body fat.

Conclusion: Promoting healthy behaviors, working on physical fitness and conscious control of changes in body composition can be helpful in stopping negative changes in body structure that increase the risk of obesity. Raising awareness about responsibility for one's own health should be an important element in training civil aviation pilots.

Keywords: obesity, physique, body fat, aircraft pilot profession

Influence of set-up on the efficacious of Active Breaks Classroom

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Background: Despite allocating more time for physical activity during the school day can be problematic due to competing for curriculum demands. Thus, teachers preferred active breaks quick and easy with no set-up or equipment, performed within the limited time not longer than 5 minutes and available space in the classroom. This study aims to assess the feasibility and potential efficacy of a 4-week, pilot, chair exercises Breaks (CEB) with and without set-up.

Methods: To archive this objective, two groups composed of 45 students five grades, mix sex classroom, aged 10–11 years from Slimani schools in Naama during academic years 2017–2018. Accepted to be a part of this experimental study. Investigated built on two protocols (a group with ABC-PA with no set-up classroom versus groups with ABC-PA with set-up). Tested by Fitness Gram as the most comprehensive and informative program that can drive meaningful behavior change and set up children for a healthy future. Before and after the application of 4 weeks of chair exercises protocols used in this study.

Results: our results showed that ABC with set-up offers many health and fitness benefits compared to ABC without set-up.

Conclusion: Support that functional mobility requires both the quality and quantity of movement. Our outcomes confirmed that set-up exercise is indispensable tools for break active programs to improve general fitness and tone muscle and strengthen global body posture. Support by this study in the benefits of ABC-PA with set-up chair as a safe activity involving more than one muscle group with better muscle power strength, endurance, balance, flexibility, coordination, and speed. The opposite of ABC-PA without any set-up. Admitted in this study as prolonged stretch aims to gain in flexibility. Its benefits are recommended to restore the effect of pre-dynamic-exercise.

Keywords: Classroom, children, physical activity, exercise, Active Breaks

Application of natural language processing (NLP) algorithm for quantitative analysis of martial arts-related papers from Web of Science

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Background: Alongside with development of data science, extraction of quantitative data from large data sets easier thanks to machine learning algorithms, such as natural language processing (NLP). The aim of this study is to obtain knowledge about interest of scientist in specific topic related to martial arts, with emphasis of most studied martial art. Material and Methods: 2580 records were extracted from Web of Science Core Collection while searching for phrase “martial art” with filter of topic. Obtained data (title, abstract) were processed with use of metaknowledge and nltk library in python environment with a method of searching for frequencies of uni-grams, bi-grams and tri-grams of title and abstracts. Results: After refining, 2142 records were left. In the abstracts analysis, most frequent uni-gram for specific martial art was “judo” (689) and “karate” (666), for bi-gram “mixed martial” (252) and “Chinese martial” (229), for tri-gram also “mixed martial art” (240) and “Chinese martial art” (225). For the title analysis, most frequent uni-gram were “judo” (132), for bi-gram it was “mix martial” (125) and “Chinese martial” (56), for tri-grams also “mix martial art” (119) and “Chinese martial art” (53). However, for specific records containing name of a style the highest number of papers were related to judo (238) and karate (200). Conclusions: Most of papers are related to mixed martial arts or chinese martial arts as general topic, but in terms of specific martial art style, judo and karate are most popular among researchers.

Subjective well-being of male and female high school students preferring sedentary leisure activities: a health status differences

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Objective: The objective of this study was to analyse the level of subjective well-being (SWB) through five SWB dimensions in male and female high school students preferring sedentary leisure activities and compare the SWB between healthy students and students with health disorders (HD).

Methods: The research sample comprised of 153 male students (healthy; n=90 and with HD; n=63) and 238 female students (healthy; n=126 and with HD; n=112) who preferred sedentary types of leisure time activities. A standardized The Bern Subjective Well-Being Questionnaire for Adolescents (BFW) was used as a primary research method. The BFW questionnaire consists of 28 items scale that measure both positive and negative feelings about the self, covering five main SWB dimensions. Non-parametric Mann Whitney U-test was used to assess differences between two independent groups of male and female high school students according to their self-reported health status (healthy vs. with HD).

Results: Significantly higher level of negative SWB dimensions was found in the group of male students with self-reported HD compare healthy male students ($U=1672$, $p=0.000$, $r=0.34$). Non-significant differences were found between healthy male students and male students with HD in the positive SWB dimensions neither in the comparison between healthy female students and female students with self-reported HD none in positive as well as negative SWB dimensions. Observed data generally presented significantly higher SWB in the group of healthy male high school students comparing male high school students with self-reported HD and the similar level of SWB in female high school students with different health status (healthy and with HD).

Conclusion: The parents are the most responsible for the leisure time spending by their children and the leisure activities choice. They should be involved in the selection of their children's leisure activities, so it should not have only sedentary character but also sport leisure activities, mainly in students with some health disorders. This should lead to increase a SWB of healthy young people but also of young people with some kind of health impairment with focus to lifelong physical activity.

Acknowledgement: This study was supported by the grant project VEGA No. 1/0409/19

Keywords: positive and negative dimensions, male and female high school students, healthy students, students with self-reported health disorders, sedentary leisure time activities.

The quality of life of elite athletes, recreational athletes and non-athletes adolescents

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The aim of the study was to broaden the findings regarding the quality of life of the male elite athletes, the recreational athletes and the non-athletes. The research sample consisted of 102 male adolescents. The respondents were divided into three groups according to their level of participating in sport. Participants from the elite group ($n=42$, 19.67 ± 1.87 years old) were soccer and tennis players. Recreational athletes ($n=39$, 20.68 ± 1.51 years old) and non-athletes ($n=21$, 21.14 ± 1.48 years old) were visiting Comenius University in Bratislava. 36-Item Short Form Health Survey was used as a research tool. The Kolmogorov-Smirnov test was used to evaluate the data normality. Kruskal-Wallis and Mann Whitney test were used to test the significance of the differences between the independent selections. Effect size was expressed by coefficient η^2 and r . The results revealed significant differences in score in each dimensions (Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional, Mental Health) between male adolescents divided according to their level of participation in sport. There are also significant differences in scores concerning physical component summary and mental component summary. Recreational athletes achieved significantly ($p\leq 0.01$) higher score in mental component summary than elite athletes and non-athletes adolescents. In physical component summary elite athletes and recreational athletes achieved statistically ($p\leq 0.01$) higher score than non-athletes. According to our results is sport activity and its level one of the determinants for increased quality of life of adolescents.

Keywords: physical component summary, mental component summary, level of sport, adolescents

Problems with diagnosing early stadia of scoliosis due to discrepancies between ATR and the Cobb angle

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A common diagnosis criterion for scoliosis is the 7° cut-off threshold for angle of trunk rotation (ATR). In early stadia of scoliosis in children, ATR and the Cobb angle often disagree, increasing the risk of a false diagnosis: while the former does not suggest scoliosis, the latter does. This research analysed discrepancies between ATR and the Cobb angle, in an attempt to find out if the 7° cut-off threshold rule for diagnosing scoliosis actually works. To do so, the study analysed ATR clinical parameters and the Cobb angle in the X-ray pictures of 117 (23 boys and 94 girls, aged 6–17 years) children who had not yet started treatment and whose X-ray pictures showed the Cobb angle of at least 10°, indicating idiopathic scoliosis. The degrees of lumbar lordosis and thoracic kyphosis were measured using the Saunders inclinometer, and back asymmetry was measured with Adam's forward bend test using the Bunnell scoliometer. In the X-ray pictures, the curvature angle was plotted according to the Cobb method. Determined for each patient, ATR and the Cobb angle were compared. Using the 7° cut-off threshold rule, scoliosis would not be diagnosed in 69 (60%) children, despite their having the Cobb angle over 10°. Therefore, to improve the method for diagnosing scoliosis based on ATR, consideration should be given to lowering the 7° ATR cut-off threshold.

Keywords: angle of trunk rotation, early diagnosis of scoliosis, scoliosis prevention

Influence of psychophysiological features on forming the combat style

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In the structure of carefully designed reference models and psychological profiles a special place is occupied by psychophysiological factors. First of all, these are typological features of nervous system property manifestation that determines the choice of individual activity style. Typological features, on the one hand, determine a person's desire to carry out activities in a certain way, and on the other hand, act as the makings of abilities and qualities (strong-willed, physical, etc.), taking into account which one or another style of activity should be chosen. It is quite natural that neurodynamic features are the object of attention of researchers studying various aspects of the adaptation of athletes to confrontation conditions, the role and place of innate inclinations in determining the effectiveness of their actions, in the pace and quality of mastering the content of specialized types of activities of various game roles or manners of conducting a duel.

To assess the characteristics of psychomotorics in the hardware-software psychodiagnostic complex "Multipsychometer-05", the test "Sensomotor reaction", which is a simple visual-motor reaction, was selected. The balance of nervous processes was studied using the method of spatio-temporal extrapolation "Reaction to a moving object". The study of the functional mobility of the nervous processes is based on determining the maximum rate of processing information on the differentiation of various positive and inhibitory stimuli. The preference in choosing a style of activity (in martial arts - fighting) is associated with genetically determined characteristics of higher nervous activity, in particular, with the nature of response to stimuli, the lability of the nervous system, with the endurance of the central nervous system when performing work of a certain power and in the time range. The attacking style is characterized by the maximum active actions of the athlete without taking into account the capabilities of the opponent. The defensive style of conducting a fight is connected with the expectation of the opponent's actions, caution in choosing attacking techniques and the most tight control of the opponent's actions. Classical wrestlers of the attacking style of conducting a duel have dominating values of neurodynamic functions, such as the frequency of touches, endurance of the nervous system, balance stability and impulsive mobility of nervous processes. Athletes who prefer a defensive style of conducting a duel have dominating processes of excitement in the nervous system and a fairly high endurance in comparison with the combined style of conducting a duel. In athletes who prefer a combined style, the accuracy of the balance of nervous processes and the speed of a simple visual reaction are higher.

Keywords: neurodynamic characteristics, highly qualified fighters, balance of nervous processes, endurance of the nervous system, mobility of nervous processes.

Cognitive features of highly qualified volleyball players

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Among the various areas, the field of psychophysiology of sports is one of the most promising sectors in the search for new approaches to the training of highly qualified athletes. Considering that the effectiveness of playing activity in volleyball depends on the ability of an athlete to perceive, analyze and process information, it is important to study the psychophysiological functions in order to control the functional state of the athlete and the correction of the training process.

The developed criteria for determining the game roles based on the psychophysiological characteristics of volleyball players will allow differentiating players by game roles and will help further optimize the training process and achieve a high sports result.

To study the cognitive features of volleyball players of various roles, a computer complex "Multipsychometer-05" was used. Next tests are included in the block of cognitive studies: "Perceptual speed" (visual perception), "Word memorization" (analysis of information with short-term memory), "Number comparison" (operational thinking), "Establishing patterns" (level of general cognitive abilities). According to the accuracy of the visual perception of volleyball players of different roles, there are significant differences ($p < 0.05$). By productivity, speed and efficiency, there is a tendency for the results to deteriorate in groups. In the test "Word memorization" all volleyball players demonstrate the speed of information processing (12.1, signal / min), exceeding the highest rates (10.5, signal / min) proposed in the unified test norms of the computer complex "Multipsychometer-05". High speed of perception and processing of information with the participation of short-term memory is typical for game sports and is due to the objective features of the game activity. The results indicate that there are significant differences in the speed of information processing with the participation of short-term memory of volleyball players of different roles ($p < 0.05$). In terms of productivity, accuracy and efficiency, there is a tendency for deterioration of results in groups. Setter players are characterized by high indicators at the stage of perception and processing of information, due to the use of the strategy of the first type of processing of information using short-term memory (according to S. Sternberg). Setters in all results of the "Number comparison" test demonstrate the best values. High characteristics of efficiency, latent period of decisions and stability with low accuracy for central blockers are explained by the fact that central blockers use the second type of Sternberg information processing strategy to solve operational problems. Setters demonstrate the highest values in terms of productivity, accuracy and efficiency, and, in terms of accuracy and efficiency, binding players have significantly better results than diagonal attackers, and there is a significant difference in performance with diagonal attackers and central blockers. Summarizing the results of cognitive characteristics of volleyball players study, we can conclude that volleyball players of different roles at each stage of cognitive activity demonstrate significant differences in speed and quality indicators of cognitive tests.

Keywords: cognitive characteristics, volleyball players, setters, attackers, analysis of information with short-term memory.

Conditions for the development of recreational and leisure activities for secondary school students

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School physical education is meant to use various forms of physical activity including recreational and leisure activities.

Analysis of the dynamics of organizational forms of school students' leisure time in recent years suggests that they used to be inconsistent, lacking a scientific background and a systematic approach to the focus and forms of leisure activities. They were often perceived as stereotyped and were not specifically focused on recreational interests and needs of children and adolescents.

Goal orientation, interest in the studies at school age is manifested not only in achieving the health-enhancing effects, but to a bigger extent in meeting a wide range of physical activity needs to let pupils express themselves, to achieve harmony, train time management skills, learn wellness, task-to-task transition, positive emotions, engage in playing and educational activities. We have identified psychosocial factors associated with physical activity of school age children. Factors contributing to the increase in physical activity are as follows: support of friends (peers), a personal example of parents, the social setting for physical activity, reduction in the time devoted to watching TV and playing computer games, encouragement from others, striving for competitiveness, social support, and use of sports facilities, equipment and inventory, self-confidence, social and cultural identity.

The main conditions for efficient development of school students recreation and leisure activities are as follows: creating an environment that would ensure a safe and enjoyable physical activity; development of curricula for physical culture, where the content and organization of classes must bring students the pleasure of physical activity, promote learning, develop relations, shaping of motor and behavioral skills; as well as the consolidation of belief in the need of physically active lifestyles; the organization extracurricular activities based on specific physical activity programs that address the needs and interests of all pupils; involving parents in the organization of recreational activities; staff training for recreational and health-enhancing activities; providing a wide range of recreational and fitness events that would be attractive to all students, evaluation of school activities for the organization of physical activity; use of recreational programs; and creating conditions for physical activity.

Keywords. health, young people, recreational activity.

Building functional training activities with the use of elements of Crossfit

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Today in Ukraine there is rapid development of fitness and recreation and new author's programs are appeared. However, at the present time become more popular classes of functional training that allow in one class use numerous muscular groups, optimally distribute the load on the entire muscle system, develop deep muscles stabilizers and improve coordination.

In our opinion, an effective method of conducting training is the integral use of the means of Crossfit and functional training. After all, this way you can combine the development of maximum manifestations of all physical qualities and ensure the development of functional body systems. Despite the large number of studies conducted in recent years of native and foreign authors on building training on Crossfit and functional training, the issues related to the special literature are not studied insufficiently. Peculiarities of the development of functional training programs with the elements of the Crossfit, which causes the urgency of conducting special researches.

The functional training is a complex of special exercises, the main purpose of which is to make effectively work small muscles-stabilizers which performed by most other exercises including power simulators which do not work or work inefficient.

In the concept of functional training the human body is regarded as a whole dynamic biomechanical system intended for synchronous, sustainable functioning. The body parts are interconnected and the muscles intersect and interlace in different layers and at different angles, providing a coordinated movement with an endless variety of interactions between them. During the practice there is a complex impact on all systems of the body.

The first and most important feature of the functional training that deserves attention is its versatility. To engage in functional training can people of absolutely different ages, ranging from schoolchildren and ending with pensioners. Taking into account the growing demand for training in the format the actual in our opinion is the study of the possibility of integral use of this direction of conditioned training.

Keywords: Functional training, Crossfit, health, Fitness.

Motor Performance of Preschool Children with Dyslalia and Normally Developing Preschool Children

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Some researchers suggested a relationship between motor and language development. Motor and language impairment or delays can influence negatively school performance and achievement. Therefore, it is very important to pay attention to preschool education and development of children. This study aimed at assessing the fine and gross motor performance of preschool children at the age of five and six years with dyslalia and normally developing children as measured by the Movement Assessment Battery for Children-2 (MABC-2). Dyslalia is the most frequent communicative disability of preschool children. The MABC-2 measures risk for motor impairment with eight subtests in three different components of fine skills and gross motor skills (MD - manual dexterity, AC - aiming and catching, BAL - balance) as well as the total motor performance. Total sample of 128 preschool children participated in this study. The sample comprised of 64 children with dyslalia (44 males and 20 females) and 64 normally developing children (26 males, 48 females). Descriptive data showed that 49% of normally developing children were classified in the green zone (normal motor performance), 31% in a yellow zone (risk for a motor delay) and 20% in a red zone (motor difficulty) on MABC-2. The majority of children with dyslalia was categorized in the yellow (22%) and red zone (41%), and 37% in a green zone. Results indicated the relationship between dyslalia and the level of fundamental motor skills (Pearson Chi-square: 6,28307, df=2, p=,043221). Dyslalia negatively influences the motor performance of boys. Early intervention may help to reduce the emotional, physical and social consequences that are often associated with dyslalia and motor difficulty before the start of school attendance.

Keywords: motor skills, dyslalia, development, preschool age.

The assessment of movement competence in Czech school age children using BOT 2 test

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Introduction: A sufficient level of movement competence (MC) is a significant health and psychosocial factor. Overall, there is a strong consensus that movement competence is positively associated with all health-related variables. A lower level of movement competence in childhood is reflected in physical activity participation and engagement in physical activity later in life. The Bruininks-Oseretsky test of motor proficiency, 2nd version (BOT2), is considered as the most comprehensive diagnostic tool. There is no normative criteria of this test in Czech republic. The aim of this pilot study was to estimate a cross-cultural validity of the BOT2 in a sample of czech school children.

Methods: The research sample was made of 83 school children (43 girls and 40 boys) of average age 10.15 ± 1.66 years. For the estimation of a MC we used the BOT 2, 2nd version - complete form.

Results: The results of our tested group show that the group's MC is in the lower part of the average level in the area of total motor composite (standard score 46.4 ± 11.8). On average, the weakest performance was recorded in the area of fine manual control. More in-depth analysis showed that the weakest subcomponent of the area of fine manual control was fine motor precision (scale score 10.1 ± 5.5). The second weakest result of the area of motor composite was manual coordination (standard score 45.3 ± 11.4). The group's most successful area was the component concerning strength and agility.

Conclusion: As a pilot study the project indicated that the BOT2 can be valid for the Czech school children regarding the body coordination, strenght and agility assessment only. It is not valid for the assessment of fine manual control and manual coordination. According to the total motor composite score on BOT-2, we found 7 children (8.8 %) with severe motor difficulties indicating the possible presence of developmental coordination disorder.

Keywords: movement competence, BOT 2, developmental coordination disorder.

The relationship between somatic and motor parameters among school-aged children

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Introduction: Over the last few years, authors of the studies on the motor skills of school-aged children have been searching for and explaining the interaction between their somatic and motor parameters.

Methodology: The purpose of the study was to extend knowledge about the levels of both somatic and motor parameters because information about their levels aids in assessing the physical fitness when designing exercise programs. To test children's motor coordination, we administered the KTK test battery (Schilling, Kiphard, 1974, 2007), which provides complex assessment of coordination abilities. The test battery consists of 4 subtests: walking backwards (WB; dynamic balance), hopping for height (HH; coupling ability, kinesthetic-differentiation ability), jumping sideways (JS; lower-body frequency ability), moving sideways (MS; complex body coordination). The somatic parameters measured included body height (BH) and body weight (BW), Body Mass Index (BMI). We applied the following statistical methods: analysis to determine the percentages in particular groups, statistical characteristics – arithmetic mean and standard deviation to characterize the sample, and ANOVA to compare the mean values among 4 age categories – 7-, 8-, 9-, and 10-year-old children. **Results:** Prepubertal obese children showed the same levels of dynamic balance and lower-body frequency ability as their 7- and 10-year-old counterparts. We found significant differences ($p < .01$) in complex body coordination between 7-year-olds and the 9- and 10-year-olds. The levels of the coupling ability and kinesthetic-differentiation ability were significantly different ($p < .01$) between 7- and 9-year-olds, 7- and 10-year-olds, and 8- and 10-year-olds. Total motor quotients were significantly different ($p < .01$) between 7-year-olds and their 9- and 10-year-old counterparts.

Conclusion: Comparing somatic and motor parameters, respectively, will be determining in terms of designing appropriate exercise programs. This study is supported by project VEGA 1/0120/19 entitled "Movement correction of the problematic behavior of students from the standard population and students with special educational needs educated under the conditions of integration".

Keywords: Prepubertal age, coordination abilities, KTK test battery, obese children

Differences in the levels of children's somatic and motor parameters

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Introduction: The purpose of the study was to extend knowledge about the levels of somatic and motor parameters among prepubertal children. This study was conducted within the project VEGA 1/0120/19 entitled "Movement correction of the problematic behavior of students from the standard population and students with special educational needs educated under the conditions of integration".

Methodology: One of the project aims is to determine the levels of somatic and motor parameters because the information about their levels may aid in assessing physical fitness levels and designing exercise programs. The somatic parameters selected included body weight (BW) and body height (BH). An appropriate parameter is the body mass index, which we computed using the well-known formula. To test children's motor coordination, we administered the KTK test battery (Schilling, Kiphard, 1974, 2007), which provides complex assessment of coordination abilities. The test battery consists of 4 subtests: walking backwards (WB; dynamic balance), hopping for height (HH; coupling ability, kinesthetic-differentiation ability), jumping sideways (JS; lower-body frequency ability), and moving sideways (MS; complex body coordination). To process the data, we transformed the data collected to MQ scores. The methods applied included: percentage distributions, statistical characteristics – arithmetic mean and standard deviation for the purpose of sample characterization, analysis of variance to compare 4 age categories in the body-weight groups.

Results: The normal-weight prepubertal children showed the same levels of lower-body dynamic balance at the age of 7 and 10. The differences in lower-body frequency ability and complex body coordination were significant ($p < .01$) between 7-year-olds and 8-year-olds. There were significant differences ($p < .01$) in coupling ability and kinesthetic differentiation ability between 9-year-olds and 10-year-olds. The total MQ scores were significantly different ($p < .01$) between 7-year-old and 8-year-old population.

Conclusions: The results of the study will be used in determining the content and design of an age-appropriate exercise program.

Keywords: Prepuberty, motor coordination, KTK subtests, normal-weight children

Comparative analysis of a direct forward stroke performed on single canoe in flatwater canoeing and in paddle pool.

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Purpose: The aim of this study is to describe and compare the movement pattern of a forward paddle stroke on a canoe in flatwater and in the paddling pool.

Material & Methods: The research was conducted in an intentionally chosen sample of five probands with high level of performance in canoeing. We watched activity of eight selected muscles during canoe forward stroke performed in the paddling pool and on the flat water. Study evaluates intraindividual and subsequently interindividual muscle timing. We used comparative analysis and the data was measured by surface electromyography (ME 5000) and 2D video-analysis.

Results: We found differences in muscles involved in direct paddle stroke forward on single canoe and in paddle pool. The main differences are that on the water the boat goes to the paddle and in the paddle pool, we push the water around us. In the first time the athlete push the boat towards the paddle. However, the athlete just pulls the paddle pool through the water. Another important difference is that in the paddle pool we do not develop the "water feeling" and the paddle pool does not have to keep balance. Canoeist is on the ground all the time

Conclusion: From our results we can recommend a paddling pool as replacement training tool specially for the winter season. We can recommend a paddle pool as a specific strengthening, but the paddling or riding on the water does not replace it.

Keywords: single canoe, paddling pool, surface electromyography, muscle activity

Structure of swimming performance to 50 meters freestyle in a short course

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The aim of this study is to identify the structure of swimming performance to 50 meters freestyle in a short course in terms of the strength and speed parameters. We tested 14 elite swimmers from the Slovak national team in the age of $- 17 \pm 1,3$ years, with body height $-178,8 \pm 9,4$ cm and body weight $- 65,8 \pm 8,9$ kg. To explain the swimming performance we use parameters from tests of squat jump - SJ (height, average and maximum power, force), countermovement jump - CJ (reactivity, stiffness, heigh, power, force, velocity), a test of repeated jumps for 10 seconds - PLYO (velocity, heigh, contact time), standing broad jump test, overhead medicine ball throw test and bench-press - BP (speed, force, power).

We used the multiple regression analysis for the creation of a multifactor model. The results show that swimming performance can be explained to 88%. The first-factor level includes the parameters of countermovement jump 54,5% and the performance in the overhead medicine ball throw test 33,5%. On the second-factor level, the height in countermovement jump is influenced by standing broad jump 58,6% and squat jump height 37,3%. The performance in the overhead medicine ball throw is affected by parameters from squat jump max- SJPmax 34,1% and bench press force-BPforce 46,4%. On the third-factor level, the squat jump height and squat jump max (SJPmax) are influenced by the Plyovelocity parameters 52%, countermovement jump stiffness-CJstiffness 29,7%, squat jump power-SJpower 44,6%. Bench press force-BPforce is affected by the parameter of bench press power- BPpower 58,1%.

All regression models entering the resultant structure was statistically significant on $p < .01$. Results revealed limiting performance factors that need to be concentrated in the training process and thus contribute to improving the training of swimmers.

Keywords: swimming, freestyle, limiting factors, structure

Analysis of the associations between balance, laterality, muscle condition and performance in youth alpine skiing category

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Purpose: The research focuses on the analysis of the associations between important motor skills that are essential for alpine skiing and performance in the youth category. The study is established on the fact, that the associations between individual concepts of motoric abilities and performance in alpine skiing are not clearly described in literature. The investigation aimed to evaluate and identify associations between selected factors of sports performance and their performance of youth alpine skiers.

Material & Methods: Group of 12 elite Czech youth junior skiers (4 male, 8 female, 16-18 years old, U18) were monitored for their training indicators, performance from the racing season 2018/19 and sports performance selected factors (anthropometry, balance, laterality, muscle condition). To evaluate the training indicators and performance, the method of analysis of training diary and rank lists of FIS races was used. Anthropometric variables were evaluated on In-Body 720 machine. Simple tests were performed to determine muscle condition and laterality. Balance was determined through force plate AMTI (type OR6-5, Advanced Mechanical Technology, Inc., Watertown, MA, USA, frame rate 200 Hz). Statistical analysis used program Statistica. To evaluate associations of monitored concepts, the Spearman's correlation (r) and (r^2) coefficient were used. Statistical significance was pre-determined as $p < 0.05$.

Results: The results of the multiple analysis display that there is a significant correlation between specific training indicators (skiing, gate skiing) and FIS race performance ($r = -0.66 - -0.84$; $r^2 = 0.43 - 0.71$). For other training indicators, we identified dependence only during strength training in summer training ($r = 0.52$; $r^2 = 0.27$). In the analysis of performance, training load and monitored concepts (laterality, muscle condition) of youth skiers, we identified only a slight statistical dependence ($r = -0.27 - 0.35$; $r^2 = 0.07 - 0.12$). We did not identify an association between performance and balance on both, dominant and non-dominant leg.

Conclusion: From the obtained knowledge, we can state that alpine skiing is a complex sport, in which there is no unilateral overloading of the organism. It has been proven that specific training in winter conditions is important for skiing performance. An important factor, for the skier's performance, is fitness training aimed at developing strength skills. Laterality and imbalance do not affect the performance of youth skiers.

Keywords: alpine skiing, performance, laterality, balance, training

Physical fitness and gross motor coordination in relation to weight status in primary school-aged children.

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Poorer motor performance has been consistently linked with a higher body weight in childhood, but the causal explanation of this association is still not fully understood. The aim of this study was to investigate and analyse differences in motor performance of overweight and obese children compared with normal-weight peers. A sample of 436 children aged 7 to 10 years, of which were 222 girls and 214 boys, performed physical fitness tests – Eurofit test battery (EUROFIT). The level of gross motor coordination was assessed using the test battery Körperkoordination-Test-für-Kinder (KTK). According to international cut-off points for Body Mass Index (BMI) from Cole et al. (2000), children were classified as being normal-weight, overweight and obese. The one-way ANOVA was used to assess differences in examined items between normal-weight group and overweight + obesity group. The findings suggest that both physical fitness and gross motor coordination of primary school-aged children are negatively associated with their weight status. Normal-weight children performed significantly better than their obese or overweight peers in endurance, speed and coordination items. Children with lower motor competence may have less opportunity to participate in physical activities. Inadequate motor performance may lead overweight or obese children to withdraw from participation in physical activity. The paper was supported by the scientific project VEGA No. (1/0120/19) with the title “Movement correction of the problematic behavior of students from the standard population and students with special educational needs educated under the conditions of integration.”

Keywords: body mass index, primary education, motor competence,

Education for person with chronic obstructive pulmonary disease: why, what and how to teach?

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Treatment, rehabilitation, adherence to a healthy lifestyle, the implementation of self-management strategies requires from patients with chronic obstructive pulmonary disease (COPD) high motivation, and self-organization. Education in the system of pulmonary rehabilitation (PR) is an obligatory part of the treatment, improving the physical and psychological condition, promoting the long-term adherence to health-enhancing behaviors.

Material and methods. The search was conducted in PubMed database; the keyword combinations were "COPD," "Organization and administration," "Prevention and control," etc. From the 2487 unique papers, 39 were included for further data research.

Results. The task of providing specific knowledge about the disease and various aspects of life with COPD requires a careful approach to planning, assessment, elaboration of study and handout materials, subsequent support and access to educational resources. A sufficient level of implementation of educational services and the professional provision of information on the envisaged topics are entirely possible while attracting different specialists, with key involvement of pulmonologists, physical therapists, and psychologists.

Assessment and determination of the patient's knowledge, anxiety and depression level, motivation, peculiarities of life and accommodation will enable considering the results for the correction of the examined indicators and the educational program itself. The choice of providing educational services using traditional lectures, printed materials, videos, or online materials should be elaborated.

Increasing patient's motivation, their cooperation with medical personnel, and active participation in the continuation of PR programs could be helpful to get feedback from providers of PR services. It is advisable to choose the most convenient ways of communication in cooperation with patients after the completion of a PR program.

Conclusions. Effective educational strategies provide long-term benefits for the patients, fewer exacerbations, better physical performance, and quality of life.

In the analyzed studies, the relationships between the effectiveness of an educational component or general rehabilitation program and the stage of COPD were poorly investigated. Thus crucial remains the issues for improving the educational part, correction of frequency and duration of meeting taking into account the phenotype or stage of COPD.

Keywords: COPD, education, pulmonary rehabilitation.

Ukrainian translation, culture adaptation and validation of Fair Play questionnaire in physical education for assessing social skills of children and adolescents

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Introduction. Social skills allow people to interact effectively and productively, both within the workplace and outside of it. They help students achieve such essential outcomes as peer recognition or popularity, respect for others, acceptance of rules, pro-social values, communication skills, and positive social interaction. The main aim of the study was to translate and provide cross-cultural adaptation into the Ukrainian language of Fair Play Questionnaire in Physical Education (FPQ-PE) that evaluate the level of social skills in children and adolescent.

Methods. Four-step translation and cross-cultural validation were performed. An obtained 16-item survey was performed with both exploratory (EFA) and confirmatory factor analysis (CFA) to establish construct validity and to understand the psychometric properties of the tool. In order to find out whether the data collected was appropriate to exploratory factor analysis, Kaiser-Meyer-Olkin (KMO) coefficient, and Bartlett test of sphericity value were calculated. Secondary school students from 9–14 age group (male: n=216, age – $M \pm SE = 11.41 \pm 0.07$; female: n=202, age – 11.5 ± 0.07) studying in 2018–2019 academic year in Lviv region (Ukraine) participated in the study. All data were analyzed using IBM SPSS Statistics V. 23 and AMOS.

Results. Linguistic validation consisted of forwarding translation, backward translation, cognitive interviews, and proofreading. Kaiser-Meyer-Olkin coefficient and Bartlett test of sphericity ($KMO = 0.887$, $\chi^2 = 2442.196$, $p = 0.000$) indicated that the EFA could be performed. The EFA was accomplished using maximum likelihood estimation and varimax rotation. The number of factors were 4 (two in pro-social and two in antisocial values) – $\chi^2 = 74.746$, $P = 0.129$. The CFA indicated a good model fit ($\chi^2 = 211.07$, $df = 98$, $p = 0.000$, $RMSEA = 0.070$, $SRMR = 0.057$).

Conclusion. Ukrainian version of FPQ-PE can be used for measuring the level of social skills in PE classes. The tool is adapted for the using in Ukrainian population and has a high level of validity and culture adaptation.

Keywords: social skills, values, quality of life, physical education, questionnaire.

Does space matter? Space as a factor influencing recess physical activity

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Introduction: In recent years decrease in physical activity (PA) amongst school children has been highlighted. The World Health Organization recommends daily moderate to vigorous PA for this age group for at least 60 minutes. Maintaining proper PA level contributes to numerous health benefits and proper children's development stimulation. It has been proved that school recess could contribute up to 40% of schoolchildren's recommended daily PA level. School recess allows pupils to meet the recommended physical activity guidelines, it can as well be crucial for their social and emotional development, increased learning effectiveness, reduced tension and school stress. The following element is listed among factors determining the quality and level of school recess: space available for pupils meaning a place where they can move freely and safely (run, play). Therefore this research attempts to define what is the relation between the type of school recess resulting from available free time space for children and pupils' physical activity level during this recess.

Material & Methods: 113 grade 2 and 3 pupils from a local elementary school participated in the research (66 girls and 47 boys). Their physical activity undertaken spontaneously during school recess was the main point of observation. Two types of 10-minute school recess were analyzed: 1)the one spent in a classroom 2)the one spent in a school hall.

Results: Significant statistical differences have been found between types of physical activity depending on space available for pupils during school recess. Clearly school recess spent in a classroom disables free movement and causes visible reduction in physical activity.

Conclusions: Organization of school recess including arrangement of space available to pupils between the classes can be understood as following the WHO guidelines defining the daily level of children's physical activity.

Keywords: Recess, physical activity, pupil, space.

Monitoring by garmin forerunner 735xt at rest, walking and running at varying velocities

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Introduction: In the past decade there was an increasing development and wide spreading of physical activities trackers with possibilities to monitor physiological values as an heart rate (HR), using user friendly) method of photoplethysmography (PPG). The aim of this contribution was to evaluate the criterion-validity of Garmin Forerunner 725XT PPG HR monitoring at rest and at locomotion at different velocities under laboratory conditions.

Research methods: Eighteen healthy volunteers – PE students (12 men, 6 women, mean age: 20,3 years, SD = 0,6) performed a running protocol using the motorized treadmill. The initial speed was set to 5 km·h⁻¹. The slope angle was set to 1%. After each 60 sec., the speed was increased by 1 km·h⁻¹. Subjects continued until exhaustion. Prior the treadmill procedure the HR at sitting position was recorded for 3 min. HR data were recorded every 5 s using Garmin Forerunner 725XT with PPG function. Data were recorded simultaneously by twelve lead patches - based ECG (Cardix) which has been used as a criterion method. Statistical analysis: Pearson's correlation coefficient (r), paired t-tests, mean squared error (MSE) and Bland-Altman plots.

Results: MSE was 4,19 b.min⁻¹ (3,55%). The Bland-Altman bias was 1,92 b.min⁻¹. Limits of agreement ranging from 34,55 to 27,11 b.min⁻¹. Pearson's r ranged from 0,68 to 0,89. Generally, mean HR, r values, MSE and the Bland-Altman bias indicated good overall agreement in this research sample, but wide LA shows necessity to judge individual measurement

Conclusions: Generally there is moderate/strong validity of PPG measurement but we found some individuals poor validity. There is evidence of individual differences among participants. Another research (for example. role of photosensitive skin etc.) is needed.

Keywords: Heart rate, photoplethysmography, Garmin 725 XT

Correction of basic motor competences of standard population in younger school age

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A multidimensional approach to children's physical literacy encompasses four interrelated areas: physical fitness, basic motor skills, daily physical activity, and psycho-social/cognitive factors. The basic goal of physical and sports education in primary education is to maintain physical literacy and to develop motor competences of children of younger school age (Whitehead & Murdoch 2006). They significantly affect the deficiency of physical activity in their daily routine of children, which proves to be one of the most serious health risk factors. Physical activity of children should be stimulated, at a younger school age they should engage in adequate physical activity for at least 60 minutes a day (Hinson 1995; US Department of Health and Human Services 2018).

The aim of the research was to find out the results of motor learning of 6 and 7-year olds, to diagnose the level of their basic motor competences and to develop them in the conditions of physical and sports education in schools. We assumed a significant positive impact on the level of motor competences. The experiment was attended by 84 pupils in the first year of primary school in Prešov (Slovakia). The level of motor competences was diagnosed with the MOBAK 1 test battery (Hermann & Seeling 2014) before and after the application of the movement program. The program included movement exercises, activities with non-traditional equipment and psychomotor games. The intervention lasted 6 months. A parametric paired t-test and a Mann-Whitney U test were used to compare the results of our study. All tests were performed at $\alpha = 0.05$. The statistical significance of the differences in the level of movement competences of the pupils in the experimental group ($SD = 2.09$; $t = 8.931$; $F = 1.693$; $p = 0.098$) after the intervention was confirmed. A better level was achieved by a group of boys in the level of competences with a subject ($SD = 1.925$; $t = -2.036$; $F = 1.421$; $p = 0.4269$). The study was carried out within the VEGA project 1/0120/19 Movement correction of problematic behavior of pupils in the standard population and pupils with special educational needs educated in conditions of integration.

Keywords: Movement literacy. MOBAK 1. Movement program.

Health behaviors as determinants of the quality of life of the elderly

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Background: Quality of life is a subject of research by representatives of various fields of science, including psychology, sociology, economics, and medicine. The results of some previous studies show that the quality of life of elderly people is related to their health behaviors. The aim of the study was to assess the relationships between the quality of life, considered in general and in detail, and health behaviors of healthy and ill elderly people from the Opolskie Voivodeship (Poland). **Methods:** 105 people participated in the study, including 61 patients and 44 healthy people, aged from 60 to 89 years. The average age of respondents was 71.2 ± 6.4 years. The main research method was the diagnostic questionnaire survey. The Health Behavior Inventory and R. Cummins's Comprehensive Quality of Life Scale were used. **Results:** The study results showed that the average value of the health behavior index in healthy respondents was significantly higher than in patients. The analysis of particular categories of health behaviors revealed that healthy persons declared normal eating habits more often than patients. The mean value of the general quality of life index was significantly higher in healthy respondents than in patients. Health status also significantly differentiated the quality of life in favor of healthy individuals in the domains of health and intimacy. In the analyzed group of respondents, health behaviors significantly determined the quality of life of patients only. The odds that the quality of life of patients are above average were greater in patients with average and higher health behavior indices than in patients with low health behavior indices. **Conclusion:** Measures of quality of life improvement should also be aimed at increasing the prevalence of health behaviors in the elderly.

Keywords: health behaviors, quality of life, the elderly, patients, the healthy

Physical and mental health conditions of the life quality of combatants under treatment and rehabilitation course

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Currently, the research of the life quality of people who participated in combat operations in the eastern Ukraine is one of the significant issues. In fact, ensuring its proper level is a main objective of our state. The Medical Outcomes Study (MOS) SF-36 questionnaire (Short Form Health Survey) was used to assess the life quality of combatants. The sum of all the studied components is grouped into two scales: the Physical component summary (PCS) and the Mental component summary (MCS). Low rates indicate a limitation of physical and psychological functioning, and, consequently, decrease in the quality of life.

110 combatants (males), who were under treatment and rehabilitation course at the Volyn Regional Hospital of Veterans of War during 2017-2018, participated in our research. Age of the participants was 37.09 ± 9.95 years.

While analyzing the results, we found that the average value of the PCS (39.11 ± 0.98) is lower in comparison to MCS (41.89 ± 0.67). The difference in average values is statistically significant at $p < 0.01$. Such data indicate the predominance of physical discomfort over the emotional life of combatants after their participation in warfare.

Among the components that make up PCS, the Physical Functioning indicator ($PF = 67.82 \pm 2.11$) has the highest value, while the lowest is the Role-Physical Functioning ($RP = 32.73 \pm 3.32$). The above-mentioned information indicates that combatants are less concerned about physical limitations when performing physical activity, but they are more likely to be restricted in the performance of day-to-day work and professional work, the limitation of the ability to carry out activities in a manner and within the limits which they were accustomed to in the Armed Forces.

At the same time, the Social Functioning ($SF = 62.05 \pm 1.92$) is the highest among MCS components, and the lowest is Role-Emotional ($RE = 45.45 \pm 4.25$). Such results reflect the significant influence of the emotional state of the performance limitation of professional work or other daily activities and, at the same time, less significant influence of the emotional state on the social activity of military officers.

Consequently, the decrease in the quality of life, physical and psychological components of health, are most affected by the limitation of life activity, due to the presence of physical problems (Role-Physical Functioning indicator) and emotional state disorders (Role-Emotional Indicator).

Keywords: quality of life, health conditions, combatants, soldiers

Awareness of patients with metabolic diseases of the importance of physical activity in treating their disorders

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Non-communicable chronic diseases, including metabolic diseases, represent a major cause of morbidity and mortality worldwide. Regular physical activity is considered a crucial component of improving the health condition of people suffering from metabolic diseases. Prescription of physical activity by the general physician or other medical specialist can influence patients' behaviour in a significant way. Objective: To get acquainted with the fulfillment of recommendations for performing physical activities by patients with metabolic diseases. Methods: The study group consisted of 407 patients diagnosed with some of the metabolic diseases. One of the important criteria for inclusion in the study was the fact that the diagnosis did not prevent performance of physical activity. To obtain the research data we used the questionnaire method - a questionnaire compiled for the needs of this particular research. Results: Patients involved in our study, in the prevention and treatment of their health problems, put particular emphasis on nutrition and eating habits. In terms of priorities, physical activity is only ranking third in this respect. The vast majority of patients involved in the study had been informed about the importance of purposeful physical activity by physicians; however, nearly half of the patients admitted their lack of willingness to carry out any form of it. The most common activities that patients undertake are domestic chores and walks. Conclusions: The data obtained suggest that some patients are not sufficiently physically active, a number of them are not even aware of the role and importance of physical activity in the treatment of their disease. There are even patients who do not consider such information relevant.

This study was supported by Grant project 1/0825/17 "Recommendations for physical activities in prevention and control of non-communicable diseases and their implementation in the eastern part of Slovakia" implemented at Pavol Jozef Šafárik University in Košice.

Keywords: Metabolic diseases. Patients. Physical activity. Prevention. Awareness

Sport in Zawiercie in the years 1945-1989

Daniel Bakota

After the end of warfare, activity was resumed on the territory of Zawiercie of the Sports Club "Warta" established in 1921. In turn, in 1948 - at the Cotton Mill of Zawiercie - the Sports Club "Włóknierz" was set up. It conducted its activity in the following sections: boxing, ice hockey, motorbike, football, volleyball and table tennis. It existed until 1980 as due to centralization tendencies it was merged with "Warta" in one Sports Club "Warta". It is also noteworthy that after the October thaw in 1956 on the wave of decentralization football teams were set up at employment establishments of Zawiercie, including in the Steelworks of Zawiercie, Industrial Glassworks, Machinery Factory, Metal Products Factory in Borowe Pole and in the Vinegar Plant. These teams played matches in the Zawiercie "B" class. Players of these teams later joined the Sports Club "Warta". Additionally, in 1967 a Sports Group "Zenit" was established at the Tin Packaging Plant.

Keywords: history of sport, Sport Club Warta, sport in Zawiercie

The effect of physical activity and of regular yoga practicing for sleeping quality, stress reduction and satisfaction of life quality

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Although many studies have been performed on the efficacy of yoga and physical activity on life quality especially in reduction of stress, minimal research has focused on improvement of sleeping quality and self-look acceptance. Based on WHO Quality of LIFE WHOQOL- BREF questionnaire and additional standard questions focusing of the self-look acceptation the research was performed on a group of 714 persons (women n=386, men n=328) randomized into three groups: yoga practitioners, physical active (yoga in) and non active control one. The whole yoga practitioners group constituted of 23%.

The active group including yoga one were sex, age, educational level and living area matched. We statistically verified previous observation that physical activity tend to improve sleeping and life quality. Besides we suggest that physical activity can be considered as an independent factor regulating disturbances of circadian rhythm and improve self-look acceptance. We postulate that shift workers and those working in disturbed circadian rhythm manner may benefit the most from physical activity especially involving both mental concentration and physical activity coordination.

Conclusion - it can be state that regular yoga and physical activity, even walking and gardening, can improve sleep quality and self-look acceptance.

Keywords: yoga, stress reduction, sleep quality

Preliminary indications of yoga effect on NK and T cell count subpopulations in peripheral blood in chronically stressed persons

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Yoga is known to be associated with reduced stress and increased well-being. However the biological and molecular basis for these benefits is far from being clear. Growing number of evidences shows that many mechanisms may be involved including the improved immune functions. To explore the potential mechanisms of these beneficial effects we designed the pilot study evaluating subpopulations of lymphocyte in peripheral blood from a randomised control group and study group consisting of individuals practicing yoga at least for one year. We measured by means of flow cytometry, relative and total number of CD3 T cells and their subpopulations CD4 and CD8 positive T cells as well as NK cells and CD19+ B cells count. Correlations between psychological variables were also explored. We demonstrated increased total number of T cells and NK cells in peripheral blood in yoga practicing persons in comparison to control group. The effect was not evident on B cells. This study did not show however statistical significance probably due to small yoga practicing group was available for this study. There are data showing improved CD4 T cells count in HIV infected persons, however this study is one of the first to explore yoga and immunological bio-markers in a non-clinical population. These findings indicate that further research into immune function is warranted, with broader studies required.

Keywords: yoga, chronic stress persons, quality of life

Slavic gymnastic for women – the traditional system of physical activity for health and beauty

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⁴Slavic Gymnastic for Women. Belarusian Tradition. Minsk, Belarus

Slavic Gimnastic for Women was reconstructed by Belarusian scientist prof. Gienadij Adamovich and published in Maxim Tank Belarusian State Pedagogical University at Minsk in 1999, as a part of student handbook “Traditional methods of psychophysical training”. It was popularized in slavic countries since 2004, in Poland since 2015. It is also known as slavic yoga. At the presentation the rules of the system compare it to hatha yoga we will be present as well as preliminary results of research diagnostic project evaluating basic immunological and endocrinological parameters studied in the small group of women practicing Slavic Gimnastic for Women for 4 months The research was conducted at Department of Immunology and Gynecology Clinic of Poznan University of Medical Sciences.

Keywords: slavic gimnastic, gimnastic for women, traditional system of physical activity

Slavic gymnastic for women – the workshop

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There will be presented the basic posture of Slavic Gimnastic for Women and advices for optimal start own practice. The traditional system of 27 postures was reconstructed by Belarusian scientist prof. Gienadij Adamovich and published in Maxim Tank Belarusian State Pedagogical University at Minsk in 1999, as a part of student handbook “Traditional methods of psychophysical training”. It was popularized in slavic countries since 2004, in Poland since 2015. It is also known as slavic yoga. There are many observational data confirming the beneficial effects of regular gymnastics practice on women's health

Keywords: slavic gimnastic, gimnastic for women

Degree of interest in horse-back riding therapy interventions for patients with neurocognitive disorders: a quantitative analysis of literature in online scientific databases

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Introduction: Since ancient times, scholars points out effectiveness of horseback riding not only for utilitarian use, but also as form of therapy for less healthy part of society. Enlightenment age scholars started to make treaties about use of such therapy and this trend is now developing not only for physical disabilities, but also for mentally ill patients. The purpose of this study is to determine trends of interest in horseback riding therapy interventions among different groups of neurocognitive disorders among different populations of people and its comparison to prevalence of such disorders.

Material and methods: Web of Science, Pubmed and Scopus databased were screened using filter with algorithm of "horseback therapy" , "horse back therapy", "hippotherapy" and "equine therapy".

Results were screened for appropriateness and relevance, then based on this end-filtering, papers were grouped regarding specificity of neurocognitive aspect of disorders.

Results:595 entries in Web of Science, 516 entries in Scopus and 123 results in Pubmed. Overall, 272 entries were subtracted. **Conclusions:**This analysis shows that most interest in such kind of therapy is focused on neurological disorders, especially with ones with cerebral palsy. There is no correlation between prevalence of selected disorders and amount of related papers.

Keywords: horse back therapy, developmental disorders, neurology, bibliometric

The strategies stress management used by people performing taekwon and patients in chronic low back pain therapy - a pilot study

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Introduction: Coping with stress refers to the actions and thoughts we use to deal with a threatening situation. The assumption was made that the mental condition has an impact, playing an active role in treatment and martial arts on the method of interpretation of the information that comes from the inside of the body and the surrounding social environment. The undertaken problem has its practical and scientific dimensions. That is why the activities are directed towards such a type of research that will contribute to the data base useful in active actions against the limits resulting from experiencing pain. Everyone will need different efficient coping strategies with stress.

Method: The present study compiles the results of research conducted in two groups that are considerably different with respect to physical fitness. Among independent variables we can mention: degree in taekwon-do, length of practice, frequency of practice a week and age. We asked: can these two realities, people of high functional fitness that practice taekwon-do and patients who attend pain therapy, exchange experiences that promote health and recovery? The sample group is composed of the people who use pain treatment programme; some of them systematically, some ad hoc (42 patients). Taekwon-do group are the people who attend trainings with different frequency and different length (70 participants). Some of the training attendants are also patients, after injuries, who want to regain fitness (8 participants/patients).

Results: The results show that pain management is influenced by many factors, proactive attitude and low degree of being preoccupied with the problem of pain. Proactivity reached a higher level (88%) in the taekwondo group.

Conclusions: Proactive health behaviors in a long-term perspective, are these strategies effective. Studies will be continued.

Keywords: efficient coping strategies, taekwon- do; low back pain, strategies of coping with pain; proactive

Taekwon-do as support for psychophysical condition and development

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The aim of this study is to extend the knowledge of selected aspect of of taekwon-do (martial art) for health in the context of central nervous system plasticity. Contact in martial arts it's a big challenge for central nervous system, emotions, cognitive aspect and body awareness.

Academic approach to the realization of specified tasks connected with taekwon- do is related to the scientific analysis of that spreads from the dimension specified by conditionings of biomechanics, kinematics to psychological dimension. Coordination, precision, velocity and accuracy are important factors - connected with nervous system. The impact of taekwon-do on the nervous system is revealed in the results of research conducted with the use of medical diagnostic techniques.

Findings show that the activation takes place with the involvement of somatosensory sphere, premotor cortex and motor cortex. Taekwon-do in a proper dose and form constitutes a remedy, acting against physical and psychical degradation of an organism because the positive influence also concerns cerebellum and the sense of balance and homeostasis of the whole organism.

The research data indicate that there are important arguments that allow us to state that participation in taekwon-do is strictly connected with an integrated activity in different fields of development - it supports the functioning of the nervous system. Research reports present in literature indicate positive changes in particular brain structures, involved, among others, in the ability to concentrate, as a result of this regularly training. Findings show that children and adults who participate in taekwon-do classes have better concentration.

Keywords: taekwon-do, velocity, health, nervous system, challenge

"Physical Activity and Health in Interdisciplinary approach"- International Scientific Conferences of Students and PhD Students: activation of the student scientific societies

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International Scientific Conferences of Students and PhD Students „Physical Activity and Health in Interdisciplinary Approach”, is a place and space of varied activities aimed at maintaining friendly and open attitude to science. The students can expand their range of interests and broaden their knowledge through active participation. Students Societies offer the chance to develop your skills and interests, network and meet like-minded people. Getting involved in a Students Society is a effective way to improve your whole university experience. These scientific meetings are also a time to stimulate activity also among the student community, which, under the supervision of their tutors, has the opportunity, sometimes for the first time, to prepare papers and presentations and present them on a wide forum of specialists in a given discipline.

As a result of cyclical formula of the conference organized and invented by dr hab. prof UJD Jacek Wasik (Jan Dlugosz University) UJD international authors repeatedly participated in following editions of the congress. This event was aimed at integration of many data obtained by means of new and advanced study, measuring tools and techniques and common interpretation. It is worth noting, that congress has gathered authors from: Japan, Canada, Ukraine, Sweden, Slovakia, Austria, Italy, Korea, Czech Republic, Poland and others which is enhancing the prestige and enables research presentations to the wider audience. The possibility of the research concentration on widely understood optimisation of man's functioning makes a vital common plane connecting all these differentiated fields of this interests. Optimisation is understood here as, on one hand, in a narrower approach, specific for e.g. motion in martial arts and, on the other, in a wider approach – optimization of motion in general (in sport and beyond), towards the widest representative approach of psychophysical optimization. In each of the mentioned aspects optimization refers to a wider field but the borders are not sharp and mental and physical functioning reciprocally influence on each other.

Research results were presented by students belonging to the following scientific student societies (from UJD): Student Scientific Societe "Activity-Culture-Health", Student Societe of Physiotherapy, Inter-Faculty Student Societe "Psychology and Culture". Active student attitude was manifested both through active participation, as well as through the couthoring of publications with the University's academic staff. It is worth noting that one of the students actively participating in the student scientific movement was honored with the title of Primus in Universitate (<http://www.ujd.edu.pl/news/view/primus-in-universitate-dla-najlepszej->).

Information on the content of subsequent conferences can be found here: 4th International Scientific Conferences for TheStudents and PhD Students „Physical Activity and Health in Interdisciplinary Approach”, III International Conference Physical Activity and Health in Interdisciplinary Approach, Physical Activity and Health in Interdisciplinary Approach Czestochowa, Poland, May 12, 2017, <http://www.physactiv.ajd.czest.pl/wp-content/uploads/2017/02/streszczenia-Konferencja-Studentcka-2016.pdf>

Keywords: health, culture, activity, health sciences, student scientific societies

Goals of interdisciplinary programmes occupational therapy - selected aspects

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The aim of the present study is to present the selected problems connected with occupational therapy that make the important part of the programmes for the treatment for mobility limitations connected with different negative emotions. This is the reason why chronic musculoskeletal pain and disability is a complex and challenging problem for many occupational therapists.

Goals of interdisciplinary programmes occupational therapy include both: increased physical functioning and reduction of pain intensity. Improvement of mood, return to work, school, or daily activities. The occupational therapy may involve working with patients at home, school or workplace, activity adaptation, the development of coping strategies, exercise, relaxation training, psychotherapy and vocational rehabilitation. Optimal functioning improvement considering the individual context of each sufferer, patient, is a common objective of the interdisciplinary therapeutic interaction. Systematization of methods for verifying the plan of functional improvement would certainly ensure objectivization of refinement of multidisciplinary cooperation (sufferer and their families, physiotherapists, psychologists, occupational therapist and others). Significant levels of musculoskeletal pain related disability can then result leading to very important detrimental effects for the patients, sufferer and their families. Both physiotherapists, psychologists and occupational therapist should be cognizant of the legal and ethical issues that concern pain.

Keywords: chronic pain, therapy, psychological aspect, rehabilitation

Aesthetic Movement Assessment Scale Research: Concept and Design

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The concept of Aesthetic Movement Scale Assessment (AMSA) is based on Flanagan Critical Incident Techniques which allow to assess time continuing process. Four aesthetic categories of movement have been selected for the study, namely fluidity, precision, harmony and rhythm, which were then performed in the form of movement patterns.

The presented patterns were filmed with a video camera and then assessed by specially trained independent examiners (Ind-Exs). For a comprehensive assessment of a given movement each motor pattern was broken down into components and then key points, forming the quality motor pattern. Key points are calculated in an interval, which indirectly (score: 0.0 – 0.5 – 1.0) define the quality of performed movement. Adding up the key point assessments (6 points in total) gives a global assessment for the entire movement that is performed, which measures the level of the performed movement. The procedures used in the method make it possible to obtain a high rate of consistency of assessment by competent judges. The AMSA method can be used in practice, both for the general population and for persons with disabilities.

Keyword: assessment, movement patterns, quality of movement, persons with disabilities

The use of the soft stick in sports rivalry supplementing aikido practice

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Jigorō Kano, the founder of judo, in his late years expressed the opinion that apart from sports rivalry, judo practitioners should also practice kendo in order to improve their defensive skills when faced with various forms of attack. The author of this article is of a similar opinion with regard to aikido – the improvement of skills, however, would be through practising with the soft stick. The purpose of this paper is to present sports rivalry which makes use of the soft stick as a supplement to the classic aikido practice. Another purpose is to find out about the opinion on aikido among people who used to practise it. The research involved 32 people who practised aikido systematically for at least two years. A questionnaire was used in which they could express their positive or negative opinions. Among the positive ones, aikido's health-promoting aspect and the skill of falling safely were mentioned most often. Among the negative views on aikido the most common was the lack of conviction that it teaches self-defence effectively and the lack of sport competition in aikido. Besides, 38 students of physical education were surveyed – they had participated in sports contests involving the use of soft sticks. The findings showed their positive attitude to this kind of rivalry. Summing up, the biomechanical analysis in the article explains the effect of the incorrect body position on the rate of movement during the execution of aikido techniques. Mistakes can be seen clearly in the presented form of sports rivalry involving the use of soft sticks. The coach can demonstrate mistakes to beginner practitioners by showing this form of rivalry with them. The results of the survey along with the biomechanical analysis suggest a positive effect of the use of soft sticks in sports rivalry on the improvement of the rate of movement and coordination of movements of practitioners. Those motor abilities are especially important in the execution of self-defence techniques in response to fast unexpected attack.

Keywords: martial arts, sport, biomechanics, teaching

Using rotation training simulator for teaching break dance

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Study Aim: Checking how exercising on the rotation training simulator can influence mastering some of break dance rotational techniques. 2. Checking how the knowledge of biomechanics on the principles of rotary motion mechanics incorporated by break dance techniques can influence their execution.

Methods and materials: In the experiment 72 physical education students were taught three break dance figures for a period of a month. They formed the experimental group A comprising 34 subjects and a reference group B of 38 people. The training simulator was used in the experiment. The group A additionally practiced break dance figures on the rotating platform. After the test was finished, the execution of dance figures in both A and B groups was evaluated. During the experiment the training simulator was also used for teaching understanding the mechanics of the rotary motion, which explains the dynamics of the motion gained as a result of executing specific break dance figures. After evaluating the execution of break dance techniques the groups were given a written test, which assessed their understanding of rotary motion mechanics.

Results: In group A the students obtained a higher average mark for the execution of the three break dance techniques. However, the significant statistical difference between the groups occurred only for execution of backspin figure. A positive correlation between execution of backspin techniques and a result in the written test assessing understanding of rotary motion mechanics was found.

Summary: The use of the rotating platform for teaching break dance was most successful in teaching backspin. Execution of this figure, as the advanced break dance performers claim, requires the least motor coordination and physical fitness from learners. The results show that the method of the experimental explanation of the principles of mechanics of the rotational movement facilitated their quicker understanding by the subjects participating in the experiment. At the same time, exercising on this device quickened the process of mastering the correct motor habits necessary for executing some break dance techniques.

Keywords: biomechanics of sport, moment of inertia, rotational motion, safety, body injuries

Quality of life of participants of instructor courses in the specialty of hatha yoga

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Exercises of physical yoga (hatha yoga) are, in our legislation, pro-health activity - physical recreation. In our country a professional degree in physical culture can be obtained in the specialty mentioned above. In Częstochowa and Toruń we are running courses after which our students get a certificate of instructor of physical recreation in the specialization of hatha yoga. Over the past several years we have educated about 1200 instructors. Examinations were conducted among people who got involved in courses mentioned above. The quality of life is affected by meeting people's expectations. In particular, it was examined if, as a result of practising physical yoga, people noticed an improvement in their physical fitness, changed qualitatively their lifestyle, could identify and reduce limitations in their bodies, feeling of their bodies have deepened, posture defects have decreased, they overcome stress easier and if their positive emotions have increased. Results indicate that people who got involved in course of pro-health activity mentioned above have significantly improved the quality of their lives on both physical and mental levels thanks to that course.

Keywords: hatha yoga, quality of life, pro-health, physical recreation