



# Quality of Life in Interdisciplinary Approach

World Scientific Congress  
22-24.11.2018 Kochcice, POLAND

# Book of Abstracts

Editors

Jacek Wąsik, Janusz Szopa



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**World Scientific Congress „Quality of Life in Interdisciplinary Approach” 22-24.11.2018 Kochcice, Poland**

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***Dear Colleagues and Friends,***

*It is our pleasure to welcome you in Kochcice near Częstochowa for the 1<sup>st</sup> World Scientific Congress „Quality of Life in Interdisciplinary Approach” .*

*I am proud that we have authors from 12 countries: **Japan, USA, Canada, Korea, Czech Republic, Slovakia, Ukraine, Algeria, Latvia, Portugal, Italy 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

### 22 November 2018

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

### 23 November 2018

|                    |  |
|--------------------|--|
| 7.30 – 9.00        | Breakfast  |
| <b>9.30-10.00</b>  | <b>Opening ceremony - Gold Banquet Room</b>  |
| <b>10.00–10.30</b> | <b>Plenary session</b><br><i>An invitation to budo for the disabled. Is budo good for the disabled? Is “budo for the disabled” good for budo?</i><br><i>prof. Kantaro Matsui</i> |
| <b>10.30-11.50</b> | <b>Session I - Gold Banquet Room</b><br><i>Chairmen – prof. Jaromír Šimonek, prof. Zdenko Reguli</i>   |
| 10.30-10.50        | <i>Reaction time and stress tolerance of police officers in specific and non-specific tests in professional self-defence training</i><br><i>Michal Vit, Miloslav Houdek</i>      |
| 10.50-11.10        | <i>Trends in physical education of Czech students who are deaf or hard of hearing</i><br><i>Petra Kurková</i>  |

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| 11.10-11.30        | <i>Sports talent search: genes versus motor tests?</i><br><i>Radoslav Židek, Jaromír Šimonek</i>  |
| 11.30-11.50        | <i>The analysis of body composition in relation to loading in ice hockey</i><br><i>Marek Kokinda, Daniel Kičura, Dávid Demečko, Rút Lenková</i>                           |
| <b>11.50-12.10</b> | <b>Coffee break</b>   |
| <b>10.30-11.50</b> | <b>Session II - Conference Room</b><br><i>Chairmen – prof. Kantaro Matsu, prof. Wiesław Pilis</i>   |
| 10.30-10.50        | <i>Effect of exercises of label and stable surface for the development of strength in dance</i><br><i>Hana Kabešová, Barbora Stoicová, Jitka Vaněčková</i>                |
| 10.50-11.10        | <i>Influence of yoga exercises on concentration of attention in children aged 13-14 years</i><br><i>Štefan Balkó, Michaela Antošová</i>                                   |
| 11.10-11.30        | <i>Meaningfulness of life of athlete and non-athlete undergraduates</i><br><i>Pavel Šmela, Petra Pačesová, Stanislav Kraček</i>   |
| 11.30-11.50        | <i>Factors condition „the feel of a partner” in ballroom dance</i><br><i>Adrianna Banio</i>   |
| <b>11.50-12.10</b> | <b>Coffee break</b>   |
| <b>12.10-13.00</b> | <b>Session III - Gold Banquet Room</b><br><i>Chairmen – prof. Anatolii Tsos, prof. Igor Grygus</i>  |
| 12.10-12.30        | <i>The quality of life in copd patients in the process of physical rehabilitation</i><br><i>Igor Grygus, Nataliia Nesterchuk, Liudmyla Prymachok, Oleksandr Nikolenko</i> |

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| 12.30-12.50        | <i>Impact of the wellness programme on the students' quality of life</i><br><i>Nataliia Nesterchuk, Igor Grygus, Mykola Ievtukh, Anton Kudriavtsev</i>  |
| 12.50-13.10        | <i>The effect of complex health preserving activities on quality of life of young generation</i><br><i>Iuliia Pavlova</i>   |
| 13.30-13.50        | <i>Physiotherapy program improves the quality of life of people with obesity</i><br><i>Sytnyk O, Voropaiev D, Olkhovik A, Yezhova O, Stepanenko O.</i>  |
| 13.50–14.10        | <i>Skiing for the disabled in Poland during 1970s</i><br><i>Arkadiusz Płomiński</i>   |
| <b>14.00-15.00</b> | <b>Lunch</b>  |
| <b>12.10-13.00</b> | <b>Session IV - Conference Room</b><br><i>Chairmen – prof. Janusz Szopa, prof. Erika Chovanowa</i>  |
| 12.10-12.30        | <i>Personal well-being as part of the quality of life: Is there a difference in the personal well-being of women and men with higher level of anxiety trait regarding their sport activity?</i><br><i>Petra Pačesová, Pavel Šmela, Stanislav Kraček</i> |
| 12.30-12.50        | <i>FMS concept in football training for children at 9-13 years of age</i><br><i>Marta Szymanek-Pilarczyk</i>  |
| 12.50-13.10        | <i>The improvement of the quality of life thanks to psychosomatic exercises.</i><br><i>Agnieszka Kmieciak, Janusz Szopa</i>   |
| 13.30-13.50        | <i>Physiological Aspects Of Hatha Yoga Exercises</i><br><i>Marzena Jaworska</i>   |

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| 13.50–14.10        | <i>Analysis of body composition of hatha yoga practitioners</i><br><i>Weronika Gawrys, Andrzej Ślęzak</i>  |
| <b>14.00-15.00</b> | <b>Lunch</b>   |
| <b>15.00-16.30</b> | <b>Session V - Gold Banquet Room</b><br><i>Chairmen – prof. Elena Bendikova, prof. Renata Urban</i>  |
| 15.00-15.20        | <i>Body mass size and cardiovascular function in young women</i><br><i>Wiesław Pilis, Krzysztof Stec, Karol Pilis, Michał Zych, Anna Pilis, Monika Poks, Michał Jagła</i>  |
| 15.20-15.40        | <i>The diagnostic value of the beep test and yoyo test in assessing the physical performance of women soccer players</i><br><i>Gabryś Tomasz, Michalski Cezary, Pilis Wiesław, Stec Krzysztof, Pilis Karol, Witkowski Zbigniew</i>   |
| 15.40-16.00        | <i>The main factors determining the occurrence of developmental dysplasia of the hip in infants based on the analysis of medical history of newborns staying in the neonatal ward of the Szpital Wojewódzki in Tychy in 2017</i><br><i>Magdalena Kiecoń, Jarosław Madowicz</i> |
| 16.00-16.20        | <i>The effect 3-month surjanamskar practice of the mobility of the spine</i><br><i>Karol Leszczyński, Jacek Buchta, Przemysław Miodek, Wiesław Pilis</i>   |
| 16.20-16.40        | <i>Development of boxing in the Dąbrowa Basin in the period of the People's Republic of Poland</i><br><i>Daniel Bakota</i>   |
| <b>15.00-16.30</b> | <b>Workshop Yoga - Conference Room</b><br><i>prof. Janusz Szopa</i>  |

**16.40–17.40 Posters Session - Gold Banquet Room**

*Chairmen – prof. Jerzy Eider, prof. Jacek Wąsik*

*Yoga and Relaxation as a Part of Public Health: A Review Study  
Krzysztof Stec*

*BMI and satisfaction with life of female University Students  
Klaudia Zuskova, Zuzana Kuchelova*

*Shoulder internal – external rotation strength comparison in adolescent  
and adult handball players  
Inese Pontaga, Janis Zidens*

*Individual sports profiles of child athletes and nonathletes  
Róbert Kandráč, Milan Turek, Tomáš Perič, Dalibor Dzugas, Marek Kokinda,  
Peter Kačúr, Beáta Ružbarská, Petra Tomková*

*BMI VS BFP as a relation to estimate the physiological soccer profile  
Zerf Mohammed, Bengoua Ali, Mokkedes Moulay Idriss*

*Injury rates in karate athletes by gender, style, graduation and competition  
level  
Mário A. Rodrigues-Ferreira, António M. Vences Brito, Maria António  
Castro, Eduardo Jorge Valente, Félix Romero, Abel Figueiredo*

*Barriers limiting the access to sports and recreation facilities in the city of  
Poznań  
Ewa Kruszyńska, Jerzy Eider*

*Influence of typological features of the nervous system on individual  
performance in running for short distances in athletes with visual  
impairment on the example of an elite athlete  
Zhanneta Kozina, Olena Chebanu, Olena Repko, Sergii Kozin, Andrey  
Osiptsov*

*The state of the physical and mental components of health in the quality of  
the life of people doing fitness  
Anatolii Tsos, Ludmyla Vashchuk, Olena Demianchuk, Olena Tomashchuk,  
Nina Dedeliuk*

*Norms for KTK tests  
Mária Majherova*

*Influence of the Author's Rehabilitation Program with Elements of Yogic Breathing on the Life Quality of the Patients After Myocardial Infarction*  
Svitlana Indyka, Natalia Bielikova, Nataliia Ulianytska

*Acute and chronic effects of passive muscle stretching on football performance*

Mokkedes Moulay Idriss, Bengoua Ali, Zerf Mohammed

*Influence of ultramarathon on the health of amateur runners*

Martin Nosek, Štefan Balkó, Josef Heidler, Jan Adamec, Dagmar Partlová, Radek Zákon, Lukáš Šauer, Vanda Hrbková, Veronika Matošková

*Senior Balance: Exercise Influence on Motor Control Response in a Dynamic Environment*

Brandie Wilde, Gongbing Shan

*Effect of psycho-emotional stress on heart rate kinetics*

Jan Hnízdil, Martin Škopek, Štefan Balkó, Martin Nosek

*The quality of life of disabled people in the town and in the countryside - research report*

Dorota Pawlik, Katarzyna Migacz

*Physical and mental health components in the quality of life of student youth*

Vasyl Pantik

*Adaptation of the circulatory system to extreme sports training*

Anna Pilis, Jakub Kacprzak, Michał Zych, Krzysztof Stec, Karol Pilis, Wiesław Pilis

*Nutrition and somatic variables of female weightlifters, soccer players, table tennis players and untrained women*

Agata Mroczek, Wiesław Pilis, Krzysztof Stec, Anna Pilis, Cezary Michalski, Karol Pilis

*Motor development and correction of behavioral disorders in prepubertal children*

Erika Chovanová

*Utilization of expert - digital tool for physical activity recommendations for cardiac patients in Eastern Slovakia*

Alena Buková, Agata Horbacz, Dana Dračková



*Statistical analysis of the influence of traction exercises on postural parameter changes in university students*  
 Erika Liptáková, Miroslava Barcalová, Alena Buková, Jozef Živčák, Jaromír Šimonek, Vladimír Harčarik

*Informedness of diabetes mellitus patients about the effects of physical activity in prevention and treatment of the disease*  
 Junger Ján, Dračková Dana, Manková Slavomíra

*A interactive child-centred creative arts workshop to explore perceptions of out-of-school and after school physical activity*  
 Dorota Ortenburger, Jacek Wąsik, Marek Kluszczynski, Paulina Ortenburger, Renata Spałek, Renata Urban  
*Physical activity of seniors and civilization diseases*  
 Agata Horbacz, Iveta Cimbolaková, Alena Buková

*Taekwon-do training improves healthy behaviours and sense of balance control during adolescence*  
 Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Dariusz Mosler

*Influence of laterality, gender and target on speed selected front taekwon-do kicks*  
 Tomasz Góra, Dariusz Mosler, Jacek Wąsik, Dorota Ortenburger

*Healthy and taekwon-do: comparison coping skills pain by patients and taekwon-do athletes*  
 Jacek Wąsik, Dorota Ortenburger, Tomasz Góra, Arkadiusz Marzec

*Does selected factors of personality correlate with chronic pain?*  
 Dorota Ortenburger, Jacek Wąsik, Olga Andriejczuk, Marek Kluszczynski

*Quality of life and health behaviours of patients with low back pain syndrome*  
 Wioletta Łubkowska, Justyna Krzepota

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| <b>18.30-2.00</b>       | <b>Gala Dinner - Gold Banquet Room</b> |
| <b>24 November 2018</b> |  |
| 8.00–10.00              | Breakfast                              |
| <b>10.00-10.30</b>      | <b>Closing ceremony</b>                |



# ABSTRACTS

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World Scientific Congress „Quality of Life in Interdisciplinary Approach” 22-24.11.2018 Kochcice, Poland



# AN INVITATION TO BUDO FOR THE DISABLED. IS BUDO GOOD FOR THE DISABLED? IS “BUDO FOR THE DISABLED” GOOD FOR BUDO ?

**KANTARO MATSUI**

*International Budo University, Katsuura, Japan*

Budo is a term that describes traditional Japanese martial arts such as karate, judo, kendo, aikido etc. The way in which the body is moved in Budo stems from the battlefield techniques of ancient Japan. There were no referees to say “Stop!” and call a halt to the conflict, so samurai had to continue fighting even if they had a disability such as an eye or arm injury. This means that since its inception, Budo has been open to people with disabilities.

“Budo for the disabled” is an important topic in martial arts. Different training methods in Budo can be shared between people with disabilities and those without. Training methods for the intellectually impaired, for example, are also suitable for teaching beginners or elderly practitioners. Not only Martial art practitioners but also fitness instructors as a whole can gain a lot from the way of thinking of “Budo for the disabled”.

At the lecture meeting, the participants can understand a coaching method of warming up, Karate punch for intellectually impaired or the reason why the one-armed person could be a champion of Kendo competition and so on. By the end of the lecture meeting, I believe that the participants will come to understand the improvements of the QOL and the beneficial relationship between the disabled and Budo because “Budo for the disabled” is not only for the disabled, but for Budo as a whole.

Keywords: budo, martial arts, disabled people

Kantaro Matsui: [kantaro55@gmail.com](mailto:kantaro55@gmail.com)

# TAEKWONDO DIPLOMACY: NEW POSSIBILITIES FOR PEACE ON THE KOREAN PENINSULA

**JOHN A. JOHNSON<sup>1</sup>, GEORGE VITALE<sup>2</sup>**

<sup>1</sup>*Keimyung University, Department of Taekwondo, Korea*

<sup>2</sup>*The National Committee on North Korea, Washington, D.C., USA*

Sports diplomacy has long been effective in bringing nations and cultures together. Sports diplomacy is a type of soft diplomacy: the more informal diplomatic engagements between non-government entities that sometimes operate with governmental support, but more often as a private exchange. Soft diplomacy has provided governments a place where greater understanding happens, which has in turn led to increased political cooperation. Taekwondo, the Korean martial art turned international Olympic sport, has been used for soft diplomatic purposes almost since its inception. Most recently, the Taekwondo demonstration teams from the Republic of Korea (ROK; South Korea) and the Democratic People's Republic of Korea (DPRK; North Korea) have been used as a tool to bridge the political gap between the two divided nations. The current research introduces a general framework of diplomacy and elucidates the soft diplomacy efforts made by ROK and DPRK Taekwondo organizations in order to provide a foundation for future research on Taekwondo diplomacy and peace negotiations.

Keywords: soft diplomacy; Choi, Hong Hi, international relations, sports diploma-cy, International Taekwon-Do Federation (ITF), World Taekwondo (WT)

John A. Johnson: [beowulf600@gmail.com](mailto:beowulf600@gmail.com)

# REACTION TIME AND STRESS TOLERANCE OF POLICE OFFICERS IN SPECIFIC AND NON-SPECIFIC TESTS IN PROFESSIONAL SELF-DEFENCE TRAINING

MICHAL VIT<sup>1</sup>, MILOSLAV HOUDEK<sup>2</sup>

<sup>1</sup>Masaryk University, Faculty of Sports Studies, Brno, Czech Republic

<sup>2</sup>Police of the Czech Republic

Introduction: Professional self-defence for law enforcement units is a highly demanding process both from the physiological and psychological point of view. The well-timed and quick reaction is often needed when jeopardy appears. Both single reaction time (SRT) and choice reaction time (CRT) are critical at the beginning of defensive action when all recourses should be activated. On the other hand, stress tolerance (ST) of police officers is essential when the task is ongoing in the middle or extended period (e. g. when defensive and offensive actions alternate during the more protracted shootout).

Methods: We used two non-specific tests by Vienna test system in our research. Reaction test (RT) for SRT evaluation and determination test (DT) for ST evaluation. Afterwards, we used two specific shooting test for quickness and accuracy evaluation among police officers. The research sample consisted of n=19 male police training instructors (age M=36.37, SD=4.69) with the length of practice of M=6.28, SD=4.11.

Results: We observed the following result in all four tests. Single reaction time measured in the RT for the research sample was M=261.56 ms, SD=33.60 ms, which corresponds to the 66.28 percentile of age norm (SD= 24.44). In the determination test, three main values were evaluated according to age norm. Correct reactions percentile M=45.56, SD=23.37, incorrect reactions percentile M=61.67, SD=28.96, skipped signals percentile M=51.44, SD=28.77. In the 1st specific shooting test, the performance was M=2.18 s, SD=0,36 s, in the 2nd specific shooting test M=1.73 s, SD=0.35 s.

Conclusion: Single reaction time among police training instructors n=18 corresponded to the 66.28 percentile of age norm. Stress tolerance of tested persons was on the middle level with a M=45.56 percentile of correct reactions, the M=61.67 percentile of incorrect reactions and the M=51.44 percentile of skipped signals. Combination of all four test is a valuable tool for reactivity evaluation in law enforcement training.

Keywords: stress, self-defence, police training, law enforcement training, shooting

Michal Vit: [vit@fsps.muni.cz](mailto:vit@fsps.muni.cz)

# SENIOR BALANCE: EXERCISE INFLUENCE ON MOTOR CONTROL RESPONSE IN A DYNAMIC ENVIRONMENT

**BRANDIE WILDE, GONGBING SHAN**

*Department of Kinesiology, University of Lethbridge, Canada*

The frequency of falls and fall-related injuries increases with age. As the population ages, falls become one of the major and more frequent health problems; not only for those with some degree of balance or mobility impairment, but also amongst healthy active seniors. As such, senior balance has become a common research focus, but few studies address the influence of environmental dynamics on balance in the elderly. Using a quasi-experimental research design, the effects of a Fitball® exercise program on performance in eight subjects was documented. The four-month Fitball® exercise program focused on improving the dynamic balance and postural stability of seniors. To evaluate progress-related changes, pre-post-tests were applied. Centre of gravity (COG) excursion, catch success rate and balance success rate were the parameters for our quantification. A synchronized data collection of 3D motion capture (12 high-speed cameras [120 Hz], VICON v8i) and ground reaction force (2 KISTLER platforms) was employed in the study. During the pre-post-tests, participants stood in a walk-like stance and were asked to catch a weighted ball that was dropped unexpectedly. The results showed significant improvements in COG control and catch success rate ( $p < 0.05$ ), which suggest that a four-month Fitball® exercise session could be applied to improve the dynamic balancing ability of seniors who have no regular physical training. In short, participating in Fitball® exercise regularly will benefit our seniors.

Keywords: motor control, senior balance, quality of life

Gongbing Shan : [g.shan@uleth.ca](mailto:g.shan@uleth.ca)



# SHOULDER INTERNAL – EXTERNAL ROTATION STRENGTH COMPARISON IN ADOLESCENT AND ADULT HANDBALL PLAYERS

**INESE PONTAGA<sup>1</sup>, JANIS ZIDENS<sup>2</sup>**

<sup>1</sup> *Department of Anatomy, Physiology, Biochemistry and Hygiene;*

<sup>2</sup> *Department of Sports games of Latvian Academy of Sports Education, Riga, Latvia*

Regular repetition of throwing motion causes faster development of the strength of shoulder internal rotator muscles in comparison with the external rotator muscles. This causes non-balanced action of the shoulder internal and external rotation and is the most important etiological factor of the shoulder joint instability in athletes trained in overhead sports. The strength of the shoulder muscles depends on both: the age and training process of the athletes. The aim of our investigation was to compare the shoulder internal- external rotation peak torques and their ratio in adolescent and adult handball players.

The shoulder joint motions in internal – external rotation are investigated using isokinetic dynamometers system in the plane of scapula at slow (60°/s) and fast (240°/s) angular velocity. Sixteen male adolescent (15 ± 1 year olds) and 21 adult (23 ± 5 year olds) handball players with injury – free shoulder joints participated in the investigation. The difference between the shoulder external/ internal rotation peak torques ratios of the dominant and non-dominant arm is none significant for both age groups at slow and fast velocity of movements.

The shoulder external/ internal rotation peak torques ratio for adult handball players is close to 0.80 at slow velocity of movement (60°/s), and 0.73 – 0.74 at fast velocity (240°/s). This confirms that the strength of both muscle groups increased proportionally in the training process in handball. This ratio for adolescent athletes is smaller – lower than 0.70 at slow and fast movements. This proves, that additional exercises must be included in the training process of the young handball players to develop the shoulder external rotators muscles.

Keywords: handball players, peak torques ratio, dominant arm, non-dominant arm

Inese Pontaga: [inese.pontaga@lspa.lv](mailto:inese.pontaga@lspa.lv)

# INJURY RATES IN KARATE ATHLETES BY GENDER, STYLE, GRADUATION AND COMPETITION LEVEL

MÁRIO A. RODRIGUES-FERREIRA<sup>1,5,6</sup>, ANTÓNIO M. VENCESBRITO<sup>1,5,6,7</sup>, MARIA ANTÓNIO CASTRO<sup>2</sup>, EDUARDO JORGE VALENTE<sup>3</sup>, FÉLIX ROMERO<sup>1</sup>, ABEL FIGUEIREDO<sup>4,7</sup>

<sup>1</sup> Sport Sciences School of Rio Maior, Polytechnic Institute of Santarém (ESDRM-IPS), Portugal

<sup>2</sup> Coimbra Health School, Polytechnic Institute of Coimbra (ESTeSC-IPC), Portugal

<sup>3</sup> Hospital Centre of Barreiro-Montijo EPE, Portugal

<sup>4</sup> Superior School of Education, Polytechnic Institute of Viseu (ESEV-IPV), Portugal

<sup>5</sup> Research Unit of the Polytechnic Institute of Santarém (UIIPS), Portugal

<sup>6</sup> Life Quality Research Centre (CIEQV), Portugal

<sup>7</sup> International Martial Arts and Combat Sports Scientific Society (IMACSSS), Poland

Karate is a combat sport in which, as in all sports, there are risk factors that lead to injury to its practitioners. The aim of this study was to analyse the injury rates by gender, style, graduation and competition level. The sample consisted of 490 karate practitioners from nine different karate styles. In this retrospective study was applied a questionnaire of morbidity, in which karate practitioners recorded their demographic data and injury episodes occurred in the last three sport seasons. Injury rates were calculated as the number of injuries per 1000 hours of exposure, that is, hours spent in training during sport seasons. It has been observed a higher injury rate in male karate athletes ( $1.32 \pm 2.13$ ) than female ( $1.26 \pm 1.77$ ). According to style, Kempo ( $1.54 \pm 1.58$ ) and Shotokan ( $1.31 \pm 2.31$ ) presented higher injury rates than Gojo Ryo ( $1.12 \pm 1.66$ ) and Shito Ryo ( $1.10 \pm 1.44$ ). Injury rates by graduation were as follows: Kyu ( $0.90 \pm 1.82$ ), 1<sup>o</sup> Dan ( $1.62 \pm 2.34$ ), 2<sup>o</sup> Dan ( $1.34 \pm 2.03$ ), 3<sup>o</sup> Dan ( $1.19 \pm 1.21$ ), 4<sup>o</sup> Dan ( $1.16 \pm 1.32$ ), 5<sup>o</sup> Dan ( $2.56 \pm 3.08$ ), 6<sup>o</sup> Dan ( $0.35 \pm 0.50$ ). Analysing the type of competition, regional competitions ( $1.86 \pm 2.05$ ) has lower injury rate than national competitions ( $2.06 \pm 1.83$ ) and international competitions ( $2.34 \pm 1.57$ ). Athletes from the Karate National Team presented lower injury rate ( $0.76 \pm 0.67$ ) than other competitions level ( $1.38 \pm 2.13$ ). In conclusion, higher injury rates were found in male, Kempo style, 5<sup>o</sup> Dan graduation and international competitions, although athletes from the Karate National Team showed lower injury rates. Coaches should analyse the specificity of training process to prevent the appearance of injuries, increasing the use of preventive processes, such as the use of protections or practice in places and with safe equipment.

Keywords: Injuries, karate, traumatology, combat sports.

Mário A. Rodrigues-Ferreira: [marioarferreira@esdrm.ipsantarem.pt](mailto:marioarferreira@esdrm.ipsantarem.pt)

# SPORTS TALENT SEARCH: GENES VERSUS MOTOR TESTS?

**RADOSLAV ŽIDEK<sup>1</sup>, JAROMÍR ŠIMONEK<sup>2</sup>**

<sup>1</sup>*Slovak Agricultural University in Nitra, Slovakia*

<sup>2</sup>*Constantine the Philosopher University in Nitra, Slovakia*

The issue of sports talent identification has long been discussed among professional public. Very often, physical tests have been used for determining child's athletic abilities before age 9. At that age children are not yet physically mature and their motor skills are being developed. Early indicators of talent in performance areas can be disclosed using genetic tests Method: The research sample included 169 pupils (97 male; mean age=7,438 y. and 72 female; mean age=7,227 y.) attending 3 elementary schools in the region of Nitra, Slovakia. All pupils underwent 9 physical tests to determine their general physical abilities. Each performance of pupils in tests was allotted points. Subsequently, 30 best ranked pupils were selected to undergo 2ml saliva sampling (GeneFix Saliva Collectors) for genetic analysis. Samples were analysed using the apparatus HiScan (Illumina inc, San Diego, USA), which allowed for analysing 400 000 polymorphisms in a human gene. The values of individual genetic score are compared with histogram of genetic score distribution in European population. Software Genomestudio (Illumina inc, San Diego, USA) and software TANAGRA 1.4.50 were used for data analysis. Based on the analysis we offered parents and coaches valid information about their children's prerequisites to certain type of physical activity, anaerobic capacity, motivation, body mass, and muscle pain. It has been proved that physical tests did not reveal the talent for sport accurately. Genetic analysis is inevitable for determining the exact parameters of talented children.

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

Jaromír Šimonek: [jsimonek@ukf.sk](mailto:jsimonek@ukf.sk)

# MOTOR DEVELOPMENT AND CORRECTION OF BEHAVIORAL DISORDERS IN PREPUBERTAL CHILDREN

**ERIKA CHOVANOVÁ**

*Faculty of Sports, University of Presov, Slovakia*

The purpose of the study was to determine the effect of physical activity on the behavior disorders in prepubertal children educated under the conditions of integration. The random sample consisted of 6- to 10-year-old integrated students attending elementary schools. The average age of 137 students was 7.41 years. To test motor coordination, Körperkoordinations-test für Kinder (KTK) was administered. Exercise programs that cover relatively dominant areas of motor behavior can be an effective learning tool to be used with children. As part of our research, we have developed a model of movement games that are attractive to children. To monitor behavior of children with Vanderbilt assessment scale for the assessment of students' behavior was administered. The NICHQ scale is available in two versions – teacher informant and parent informant. To process and evaluate collected data the following statistical methods were used: descriptive statistical methods, normality of data distribution – *Shapiro-Wilk test, parametric paired samples t-test, or non-parametric paired samples t-test*, to compare relative frequencies a *test of relative frequencies*. Cronbach's alpha for determining reliability. By increasing the attractiveness, effectiveness and esthetics of physical activities children's health improved and behavioral disorder symptoms reduced. A better level was achieved by a group of girls in their abilities: dynamic balance ability, ability to connect movements, kinesthetic - differentiation ability. The group of boys reached a better level in their abilities: rhythmic ability. Strengths and difficulties questionnaire provided information about students in five dimensions. Highest score was recorded for *hyperactivity* dimension, which is deviant from normal scores. Students did not achieve normal scores in *conduct problems* dimension. Normal scores were observed in the dimensions of *peer problems* and *prosocial behavior*. The study was conducted within the project VEGA 1/0625/16 The effect of physical activities on the development of motor abilities in intact and integrated children with behavior disorders.

Keywords: KTK tests, Vanderbilt assessment scale, integrated children, 7-year-old children, Exercise programs

Erika Chovanová: [erika.chovanova@unipo.sk](mailto:erika.chovanova@unipo.sk)

# THE ANALYSIS OF BODY COMPOSITION IN RELATION TO LOADING IN ICE HOCKEY

MAREK KOKINDA<sup>1</sup>, DANIEL KIČURA<sup>3</sup>, DÁVID DEMEČKO<sup>2</sup>, RÚT LENKOVÁ<sup>1</sup>

<sup>1</sup>*Department of Sport Kinanthropolo, Faculty of Sports, University of Presov, Slovakia*

<sup>2</sup>*Department of Educology of Sports, Faculty of Sports, University of Presov, Slovakia*

<sup>3</sup>*HC Kosice, Kosice, Slovakia*

The issue of anthropometric profiles of ice hockey players is currently addressed by experts who select players for professional ice hockey. From the viewpoint of all-season monitoring, which may be divided into preseason and in-season, there is lack of knowledge about changes in body composition that occur as a result of training. The purpose of the study was to analyze the changes in body composition as a result of ice hockey training and matches during the preseason and in-season. The participants were 24 senior ice hockey players from an elite ice hockey team: 2 goalkeepers, 9 defenders, 13 forwards: mean age =  $27.9 \pm 4.99$  years. The research methodology was divided into three stages: 1. summer off-ice training, 2. on-ice training, and 3. in-season. We analyzed body composition using the direct segmental multi-frequency bioelectrical impedance analysis in each of the stages. Body composition analyses during the in-season were conducted once per month always before and after a league game. The parameters assessed included body weight (BW), 2. total body water (TBW), 3. body fat mass (BFM), 4. skeletal muscle mass (SMM), 5. basal metabolic rate (BMR), 6. visceral fat area (VFA). These parameters were analyzed also in relation to particular body segments. The results showed that summer off-ice preseason had the most significant effect on body composition ( $p < .05$ ). The SMM increased and BFM decreased, on average, by 1.4 kg, and 1.8 kg, respectively. These changes caused the increase in BMR by 45.5 kcal and decrease in VFA by  $17.2 \text{ cm}^2$ . The most significant changes were found for defenders. When determining the effects of on-ice training on body composition at the beginning of the in-season, there were no statistically significant differences in body composition ( $p < .05$ ). The differences in pregame and postgame body composition shows that players experience changes in body composition, especially in BW and BFM ( $p < .05$ ). The study was supported by project VEGA 1/0573/18 "The function of trunk muscle strength in the development of athletic performance and injury prevention".

Keywords: ice hockey, training, InBody, motor performance capacity.

Marek Kokinda: [marek.kokinda@unipo.sk](mailto:marek.kokinda@unipo.sk)

# TRENDS IN PHYSICAL EDUCATION OF CZECH STUDENTS WHO ARE DEAF OR HARD OF HEARING

**PETRA KURKOVÁ**

*Palacký University Olomouc, Faculty of Education, Czech Republic*

The purpose of this study was to analyse differences in students' viewing in the second stage of elementary schools for the deaf or hard of hearing in physical education classes with other studies. In this study participated 86 students who are deaf or hard of hearing (56 boys, and girls 30; an average age of  $14.3 \pm 1.4$  years). The one-sample and two-sample t-test were used to compare result of our study with results of the populations' studies in the Czech Republic and at Slovakia. All tests were performed at a level of  $\alpha = 0.05$ .

In the Importance and Demandingness indicator, statistical significance was confirmed. Students in our study considered physical education to be more important (2.02; SD = 0.96,  $t = -2.777$ ;  $p = 0.007$ ) and demanding (3.23; SD = 0.98,  $t = -3.009$ ;  $p = 0.003$ ) than students from Czech and Slovak general schools. In comparison of our study with the results of students from Czech general schools, the average value was lower in the Popularity indicator and Czech students from general schools considered physical education to be more popular than our students. In comparison of small scopes study, statistically significant differences were found, where students in our study view physical education as more demanding (3.23; SD = 0.98,  $t = -2.605$ ;  $p = 0.010$ ) compared to Slovak students with sensory disabilities.

We can conclude that there is a trend where students who are deaf or hard of hearing view physical education as more important than students from general schools in both the Czech Republic and Slovakia. In addition, Czech students who are deaf or hard of hearing view physical education as more demanding compared to Slovak students with sensory disabilities.

Keywords: popularity; importance; demandingness; effort

Kurkova Petra: [petra.kurkova@upol.cz](mailto:petra.kurkova@upol.cz)

# THE QUALITY OF LIFE IN COPD PATIENTS IN THE PROCESS OF PHYSICAL REHABILITATION

**IGOR GRYGUS, NATALIYA NESTERCHUK, LIUDMYLA PRYMACHOK, OLEKSANDR NIKOLENKO**

*Institute of Health, National University of Water and Environmental Engineering, Rivne, Ukraine*

Chronic obstructive pulmonary disease has a significant negative impact on the quality of life, including imposing restraints upon work, normal physical activity, housework, social and family activities, as well as sleep regimens. Rehabilitation has a leading place in the complex treatment of patients with chronic obstructive pulmonary disease. The objective of the study is to investigate the quality of life in patients with chronic obstructive pulmonary disease throughout the physical rehabilitation process. The research was based on a sample of 124 patients with severe chronic obstructive pulmonary disease being examined. The sample population was composed of 64 (51.61%) males and 60 (48.39%) females. Of the patient files reviewed, the average age was  $59.19 \pm 0.74$  years. The author elaborated the physical rehabilitation programme for the patients, taking into account the results of the examination of the functional state, external respiration functions and physical activity. We used the Ukrainian version of the methodology for assessing the quality of life, which contains 100 questions, 4 questions for each of the 24 facets, as well as 4 "global questions" to assess the Overall Quality of Life and General Health. The questionnaire assesses the indices of the following domains: physical, psychological, independence level, social relationships, environment and spiritual sphere. The results of the study suggest that the application of the proposed physical rehabilitation programme in female and male patients with severe chronic obstructive pulmonary disease has allowed improving the overall quality of life and general health. Improvement of the quality of life was due to enhanced indicators in problematic facets. Patients in the experimental (study) group noted decreased discomfort, decreased drug addiction, increased mobility, increased vital activity, ability to perform daily tasks, decreased fatigue, improved sleep, enhanced thinking, as well as improved personal interactions.

Keywords: chronic obstructive pulmonary disease, patients, physical rehabilitation, quality of life.

Igor Grygus: [grigus03@gmail.com](mailto:grigus03@gmail.com)

# EFFECT OF EXERCISES OF LABILE AND STABLE SURFACE FOR THE DEVELOPMENT OF STRENGTH IN DANCE

**HANA KABEŠOVÁ, BARBORA STOICOVÁ, JITKA VANĚČKOVÁ**

*Jan Evangelisty Purkyně University, Czech Republic*

**Purpose:** Obsolete approaches require modernization and subsequent acceptance of new dance trends, including modern practices and innovations (Brtníková, 2008; Frömel, Stratton, & Vašendová, 2002; Zajacová, 2013). The article deals with the influence of exercises on labile and stable surfaces on the development of strength abilities in dancers in older school age. The aim is to verify the created exercise program and to determine the different influence of strength training on a labile and stable surface. To determine change in performance after applying the training program, motor tests are determined.

**Material & Methods:** The research was conducted on 24 dancers from Dance Center Marverci, junior (dancers aged 11-15). In the evaluation was used a standardised test battery. For the evaluation of the dynamic force, the number of saddle-leagues in 1 min, the number of clicks in 1 min, the number of shifts in 1 min. For static force evaluation, squat stamina (s), cranking (s) and shingle (s) stamina were monitored. The strength level data was obtained by performing input and output motor tests and comparing their differences before and after the application of the fitness program.

**Results:** The group using exercises on labile surfaces achieved a higher level of strength than the control group, there was a statistically significant difference in all motor tests. The training program influenced the strength test scores of 62-77 percent. Only in the test of the number of shavings the performance was influenced by the training program from 24 percent. Training with the use of labile balancing aid (gymball) does not develop dynamic and static power more than training without the use of a stable pad.

**Conclusion:** Dancers who have completed a six-week program with exercises on labile surfaces have made significant improvements in strength testing ability. There was no statistically significant difference between exercises on labile and stable surfaces due to the stimulation of strength in older school-age dancers.

**Keywords:** strength, balance, gymball, dance, older school age

Hana Kabešová, Email: [hana.kabesova@ujep.cz](mailto:hana.kabesova@ujep.cz)



# IMPACT OF THE WELLNESS PROGRAMME ON THE STUDENTS' QUALITY OF LIFE

**NATALIIA NESTERCHUK, IGOR GRYGUS, MYKOLA IEVTUKH, ANTON KUDRIAVTSEV**

*Institute of Health, National University of Water and Environmental Engineering, Rivne, Ukraine*

Introduction: Health directly affects the working capacity and labour productivity, the country's economy, the moral climate in society, the education of youth, reflects the image and quality of life. The scientists view the quality of life as a health-related integral characteristic of the physical, psychological and social relationship of either a healthy or sick person, based on his/her subjective perception. Health enhancement is an important factor in improving the quality of life of students. Material and Methods: 152 2<sup>nd</sup> year undergraduate students took part in the study: control group (n = 76) and intervention group (n = 76) that had identical age range and physical fitness. The students of the control group were engaged in the generally accepted system of physical education, while the students of the trial (intervention) group engaged in the suggested sport and physical education programme. Results: The comprehensive physical education curriculum of students was based on the results of the ascertaining experiment and included three periods: introductory, main and final ones. Each version of the healthy physical education programmes had its own peculiarities. At the end of the study, in the students of the trial group ( $p < 0.05$ ) the results of the Stange's tests ( $60.80 \pm 0.72$  s), Gench's test ( $29.08 \pm 0.39$  s), the Skibinski index ( $32.42 \pm 0.92$ ) and the Ruffier functional test ( $7.30 \pm 0.28$ ) significantly improved. Conclusions: The application of the suggested personal wellness method allowed to significantly improve the functional status and physical performance of the students of the trial group. Moreover, this will contribute to their more effective health enhancement, adaptation to education, and improving quality of life.

Keywords: wellness, programme, students, quality of life.

Nataliia Nesterchuk : [n.e.nesterchuk@nuwm.edu.ua](mailto:n.e.nesterchuk@nuwm.edu.ua)

# INFLUENCE OF YOGA EXERCISES ON CONCENTRATION OF ATTENTION IN CHILDREN AGED 13-14 YEARS

ŠTEFAN BALKÓ, MICHAELA ANTOŠOVÁ

*Department of Physical Education and Sport, Faculty of Education, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic*

**Purpose:** The aim of the study is to verify effect of yoga exercises on concentration of attention in pupils of primary school.

**Material and Methods:** The research was carried out on 46 pupils aged 13-14 years. The standardized questionnaire d2 was used to determine the level of concentration of attention. Variables were monitored before and after "normal" lessons. In this case, the entrance values from the d2 questionnaire were compared with the values found in the output measurement at the end of the lesson. Furthermore, the effect of proposed yoga exercises on concentration of attention was monitored after a five-week intervention.

**Results:** The results indicate that the overall performance ( $p = 0.001$ ,  $\omega^2 = 0.78$ ) and concentration performance ( $p = 0.001$ ,  $\omega^2 = 0.525$ ) has been significantly improved within one lesson. Similar results were found after five-week intervention, both in the overall performance ( $p = 0.001$ ,  $\omega^2 = 0.814$ ) and in the concentration performance ( $p = 0.021$ ,  $\omega^2 = 0.138$ ).

**Conclusions:** The result show that yoga exercises can have a positive influence on concentration. For this reason, it would be appropriate to include these exercises in the teaching of theoretical subjects at the 1st and 2nd grades of elementary school. This may improve the overall performance of pupils in theoretical subjects, but we can also expect a positive effect on the mind and the harmonious development of the individual.

**Keywords:** Physical education moments; teaching; mind; primary school; intervention

Štefan Balkó: [balkoste@gmail.com](mailto:balkoste@gmail.com)

# THE EFFECT OF COMPLEX HEALTH PRESERVING ACTIVITIES ON QUALITY OF LIFE OF YOUNG GENERATION

**IULIIA PAVLOVA**

*Theory and Methods of Physical Culture Department, Lviv State University of Physical Culture, Ukraine*

In the condition of the unsatisfactory economic situation and the negative medical condition, the matter of the improvement of life quality of young generation remains a matter of paramount importance for Ukraine. The participation of schools in complex health preserving projects is available and effective opportunity to receive some benefits for health and development, however, the connection between studying at these schools and high life quality has not been investigated thoroughly. The aim of the investigation was to assess the role of health promoting schools in ensuring of students' life quality.

**Methods.** The project activity of 92 health promoting schools (Lviv region, Ukraine) was analyzed. For the estimation of health preserving activities, the Questionnaire for the Coordinator of the European network of health promoting schools was used. For the evaluation of life quality, 2108 students of 10–11 grades were surveyed. Data collection was carried out with use of SF 36, PedsQL. Physical activity level was assessed with PAQ-A questionnaire. The regression analysis was conducted for the detection of factors which define the high quality of life.

**Results.** According to linear and logistic regression analysis the crucial criteria of high level of Physical Component scale was sex, engagement in the sports section, sports training more than once a week in leisure time, the high level of physical activity at school, healthy eating habits and studying at the health promoting school. For Mental Component Scale, studying at health-promoting school, level of physical activity and relations with classmates had crucial meaning.

**Conclusions.** Chances of a high quality of life are higher for males (by 2,2–2,6 times), for students who are engaged in a sports section, or have a high level of physical activity (by 2,1–2,8 times), or studying at a school that conducts system health preserving work.

**Keywords:** quality of life, students, health promoting school, SF 36

Julia Pavlova: [pavlova.j.o@gmail.com](mailto:pavlova.j.o@gmail.com)

# EFFECT OF PSYCHO-EMOTIONAL STRESS ON HEART RATE KINETICS

JAN HNÍZDIL, MARTIN ŠKOPEK, ŠTEFAN BALKÓ, MARTIN NOSEK

*University of J. E. Purkyně, Czech Republic*

**Purpose:** It is generally known that heart rate (HR) responds to stress. Functional testing of human performance could be for some individual stress factor. Particularly when they are have no previous experience. Psycho – emotional stress may influence value of HR. It could cause problems with interpretation of test results. Especially when it depends on HR kinetics (for example Conconi test). Aim of this study was quantify amount of heart rate which is affected by emotional stress.

**Material & Methods:** We tested forty subjects using adapted Conconi protocol on motorized treadmill. Tested were physical education student different age and fitness level. They were divided into two groups experience and unexperienced with pervious laboratory testing. Subjects were tested twice in four days. Initial speed of the running treadmill test was determined in the range of 8 to 11 km.h-1, according subjects fitness level. Speed was increased gradually every 150 m of 0.5 km h-1 to the maximum speed when further increases were impossible. HR was recorded at every 5 sec. With statistic tools for repeated measure we tried to found difference in HR between first and second measure.

**Results:** We found significant differences in HR between repeated measures especially in first third of the test. We detected significant heteroscedasticity HR values of person without pervious experience with testing. There is significant difference at HR change (expressed as mean difference between booth tests) at group familiar with testing protocol and no experiences ones. Maximal differences in HR values between both tests were 30%

**Conclusion:** Using only HR as a predictor of metabolic response to exercise testing has a limitation. By some individual there is 30% difference between first test experience and repeated measure expressed in HR value. We assume that is caused mainly by psycho – emotional stress. Previous experience with particular test is needed wen HR is only one predictor of organism metabolic response to load.

**Keywords:** Heart rate, Psycho – emotional stress

Jan Hnízdil, PhD. Email: [jan.hnizdil@ujep.cz](mailto:jan.hnizdil@ujep.cz)

# THE EFFECT 3-MONTH SURJANAMSKAR PRACTICE OF THE MOBILITY OF THE SPINE

**KAROL LESZCZYŃSKI<sup>1</sup>, JACEK BUCHTA<sup>1</sup>, PRZEMYSŁAW MIODEK<sup>1</sup>, WIESŁAW PILIS<sup>1,2</sup>**

<sup>1</sup> *Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University, Czestochowa, Poland*

<sup>2</sup> *Department of Physiotherapy, Opole Medical School, Opole, Poland*

Dynamic Surjanamaskar (DSN) is one of the yoga techniques, which influences the flexibility of practitioners. Therefore, the goal of the presented work is to show the mobility of the spine following the 3-month DSN practice. The experiment involved 20 young female students; their age, weight and height of the body were determined, as well as the composition of the body. Next, the mobility of the lumbar spine in the sagittal plane was examined by performing the Schober's test-1 (forward flexion) and the Schober's test-2 (extension). The mobility of the thoracic spine was examined using the Otta's test-1 (forward flexion) and the Otta's test-2 (extension). The usage of the tests was following standard procedures. Then, the examined women performed the DSN practice (the Rishikesh version) for 3 months, practicing 3 times a week for 30 minutes at their own pace. After cessation of the training period, the procedures of somatic and functional examination of the spine were repeated. The applied 3-month DSN practice did not cause any somatic changes but only increased mobility in the thoracic part of the spine, diagnosed with the Otta's test-1 ( $p = 0.025$ ). In summary the lack of somatic changes after the applied DSN practice indicates too low workload of the exercisers but it was adequate to partially increase the mobility of the spine, suggesting that this type of physical activity is beneficial as a prophylactic and/or therapeutic manner on this part of the body.

Keywords: Dynamic Suryanamaskar, prophylactic, therapy, spine

Karol Leszczyński: [leszczyński.karol97@gmail.com](mailto:leszczyński.karol97@gmail.com)

# THE MAIN FACTORS DETERMINING THE OCCURRENCE OF DEVELOPMENTAL DYSPLASIA OF THE HIP IN INFANTS BASED ON THE ANALYSIS OF MEDICAL HISTORY OF NEWBORNS STAYING IN THE NEONATAL WARD OF THE SZPITAL WOJEWÓDZKI IN TYCHY IN 2017

**MAGDALENA KIECOŃ, JAROSŁAW MADOWICZ**

*Department of Physiotherapy WSB Academy in Dąbrowa Górnicza*

**Background.** The occurrence of developmental dysplasia of the hip (DDH) and physiological immaturity of the hip joints is currently a significant part of dysfunctions in the musculoskeletal system in infants. **Aim.** To investigate the main factors determining the occurrence of developmental dysplasia of the hip in newborns.

**Material and methods.** The research included retrospective analysis of medical records of 1591 patients (3182 hip joints) of the neonatal ward of the Szpital Wojewódzki Megrez sp. z o.o. in Tychy in 2017.

**Results.** The frequency of occurrence of DDH among newborns in the neonatal ward of the Szpital Wojewódzki in Tychy in 2017 was 2.7%. The occurrence of DDH was higher among girls than among boys and predominant in the right joints. The study did not detect any significant relationships between the occurrence of DDH and the type of childbirth, week of pregnancy, multiplicity of pregnancy and birth weight of newborns. However, a statistically significant relationship was detected between the occurrence of physiologically immature joints and the birth weight of newborns.

**Conclusions.** The occurrence of DDH was more frequent among girls than among boys. DDH occurred more frequently in a statistically significant way in the right joints. A significant relationship was found between the occurrence of the birth weight of the newborns and the type IIa on the Graf scale. There was no significant relationship between the occurrence of DDH and the type of childbirth, week of pregnancy, multiplicity of pregnancy and birth weight of newborns.

**Keywords:** DDH, developmental dysplasia of the hip, infants, pediatrics, hip joint

Magdalena Kiecoń : [magdalenakiecon@gmail.com](mailto:magdalenakiecon@gmail.com)

# PERSONAL WELL-BEING AS PART OF THE QUALITY OF LIFE: IS THERE A DIFFERENCE IN THE PERSONAL WELL-BEING OF WOMEN AND MEN WITH HIGHER LEVEL OF ANXIETY TRAIT REGARDING THEIR SPORT ACTIVITY?

**PETRA PAČESOVÁ, PAVEL ŠMELA, STANISLAV KRAČEK**

*Comenius University in Bratislava, Faculty of Physical Education and Sport*

Anxiety trait is a relatively stable personality trait, which refers to the differences between individuals in terms of their tendency to experience state anxiety in response to the anticipation of a threat. Regular sport activity may influence some aspects of emotional adjustment in positive way and so on an individual's well-being. The aim of the study is to find out the possible differences in the level of separate dimensions of personal well-being of men and women with increased anxiety trait level, regarding their sport activity. The research sample consists of 74 respondents in late adolescence [30 men (athletes: n= 12 (20.25± 1.36 years), nonathletes: n= 18 (20.83± 0.99 years) and 44 women (athletes: n= 18 (20.50± 2.46 years), nonathletes: n=26 (20.42± 1.10 years)]. We have used the standardized STAI questionnaire to determine the level of anxiety trait and standardized BDP questionnaire to determine the level of personal well-being (with respect to its two positive dimensions and three negative dimensions). The results have showed that athletes males demonstrated a significant higher level of positive attitude towards life (p= 0.01) and a significantly lower level of awareness of problems (p= 0.04) and depressive mood (p= 0.03) as nonathletes males. Athletes females demonstrated a significant higher level of positive attitude towards life (p= 0.02) and selfevaluation (p= 0.00) while a significant lower level of depressive mood (p= 0.04) as nonathletes females. Our findings indicate that regular sport activity can be a suitable instrument to increase personal well-being (in some aspects of well-being) of women and men with higher level of anxiety trait.

Keywords: well-being, quality of life, anxiety trait, sport activity, late adolescence

Petra Pačesová : [petra.pacesova@uniba.sk](mailto:petra.pacesova@uniba.sk)

# BODY MASS SIZE AND CARDIOVASCULAR FUNCTION IN YOUNG WOMEN

WIESŁAW PILIS<sup>1,2</sup>, KRZYSZTOF STEC<sup>1</sup>, KAROL PILIS<sup>1</sup>, MICHAŁ ZYCH<sup>1</sup>, ANNA PILIS<sup>1</sup>,  
MONIKA POKS<sup>1</sup>, MICHAŁ JAGŁA<sup>1</sup>

<sup>1</sup>*Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University, Czestochowa, Poland*

<sup>2</sup>*Department of Physiotherapy, Opole Medical School, Opole, Poland*

Epidemiology of overweight and obesity, like hypertension, is a global health problem and suggests that there is a strong causal relationship between the two factors. Therefore, the aim of the presented work is to show how the blood pressure and its derivatives change, depending on the body mass of young women. The study involved 72 women aged 20 to 40 years characterized by malnutrition, normal body weight, overweight, class I obesity, class II obesity and class III obesity. The following values were determined for all women: age, body mass (BM), body height (BH), waist circumference (CW), hip circumference (CH), body mass index (BMI), waist to hip ratio (WHR), heart rate (HR), systolic blood pressure (SBP), diastolic pressure (DBP), pulse pressure (PP), mean arterial pressure (MAP), rate-pressure product (RPP). The examined groups of women differed in the size of BM, CW, CH, BMI ( $p < 0.001$ ) and WHR ( $p < 0.01$ ). In the range of cardiovascular efficiency indexes of the studied women, there were differences in the following range: SBP ( $p < 0.001$ ), DBP ( $p < 0.01$ ), MAP ( $p < 0.001$ ) and RPP ( $p < 0.05$ ). This investigation found that the excessive body mass gain results in achieving physiological border blood pressure for young women, which leads to worsening myocardial function.

Keywords: women, obesity, overweight, hypertension

Karol Pilis : [k.pilis@ajd.czest.pl](mailto:k.pilis@ajd.czest.pl)



# THE DIAGNOSTIC VALUE OF THE BEEP TEST AND YOYO TEST IN ASSESSING THE PHYSICAL PERFORMANCE OF WOMEN SOCCER PLAYERS

**GABRYŚ TOMASZ<sup>1</sup>, MICHALSKI CEZARY<sup>1</sup>, PILIS WIESŁAW<sup>1,2</sup>, STEC KRZYSZTOF<sup>1</sup>, PILIS KAROL<sup>1</sup>, WITKOWSKI ZBIGNIEW<sup>1</sup>**

<sup>1</sup> *Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University, Czestochowa, Poland*

<sup>2</sup> *Department of Physiotherapy, Opole Medical School, Opole, Poland*

Assessment of the soccer players' performance ability is an important issue in terms of motoric preparation. Therefore, laboratory and field tests of aerobic and anaerobic physical performance are used in this area. Hence, the aim of the present study is to compare the usefulness of aerobic physical performance indexes recorded during the execution of the Beep test and Yoyo test by highly trained women soccer players. 10 soccer players of one of Poland's premier soccer clubs participated in the research. After determining the age and somatic data of the surveyed women, the Beep test was performed and the Yoyo test was performed the next day. Before the test and during the separate loads for each test, the following subjects' physiological variables were recorded: heart rate (HR), tidal volume (VT), number of breaths performed in 1 minute (Rf), minute pulmonary ventilation (VE), minute oxygen uptake ( $VO_2$ ), minute carbon dioxide excretion ( $VCO_2$ ). Moreover ventilatory equivalent for oxygen ( $VE/VO_2$ ), ventilatory equivalent for carbon dioxide ( $VE/VCO_2$ ), respiratory exchange ratio (RER), and "oxygen pulse" ( $VO_2/HR$ ) were calculated. For statistical analyzes only data obtained at maximum loads in both tests were accepted. Comparative studies of the analyzed variables showed that all values recorded in both tests reached maximum values and were similar; also they were statistically not different. The conclusion is that both applied tests loaded the soccer players to a similar maximum extent and the tests are adequate in assessing their aerobic physical performance.

Keywords: soccer players, women, physical performance

Karol Pilis : [k.pilis@ajd.czyst.pl](mailto:k.pilis@ajd.czyst.pl)

## PHYSIOTHERAPY PROGRAM IMPROVES THE QUALITY OF LIFE OF PEOPLE WITH OBESITY

**SYTNYK O, VOROPAIEV D, OLKHOVIK A, YEZHOVA O, STEPANENKO O.**

*Department Physical therapy and sports medicine, Sumy State University, Sumy, Ukraine*

A study of quality of life of people with obesity, which accompanies various diseases. During the study it has been evaluated: subjectively – assessment of quality of life (WHOQOL-BREF inquiry) using questionnaires; objectively – indicators of physical development and functional status (height, weight, neck, chest, waist, hips, shoulders circumference, shoulder width, shoulder arch, strength abilities of muscles of the back and abdomen, heart rate, blood pressure, respiration rate. These figures were determined before the start of the physiotherapy program and 2 months after it commenced. The functional state of the cardiovascular system is monitored at each lesson. The study involved a group of 30 people with I-II degree obesity, whose average age was 50 (from 42 to 56). The average body weight was 95 kg (from 86 to 114 kg). Analyzing initial results, it should be noted that the majority of respondents rate their health and quality of life as poor or mediocre. In most cases, this depends on age-related diseases that cause atherosclerosis, which affects physical and psychological state. In order to improve quality of life, we proposed a physiotherapy program, which combined the work of two specialists – an endocrinologist and a physiotherapist. The endocrinologist developed a diet program, and the physiotherapist developed a regular physical exercise program. The diet was to control nutrition – a low-calorie diet with calorie restriction up to 1200 kcal/day. The physiotherapy program was represented by physical exercises of force and aerobic nature with rest periods in the form of muscle relaxation and breathing exercises. This load lasted for a month, 5 times a week. Control measurements taken two months after the start of the experiment indicate a positive trend in the quality of life of examinees. Indexes of domain Physical health and Psychological indicated an improvement in their physical and emotional state. At the same time, circumference dimensions of the body, their correlation, especially the shoulder arch and waist circumference, have objectively decreased, the body mass index has decreased, the response of cardiovascular and respiratory systems to aerobic exercise has improved.

Keywords: quality of life, obesity, physiotherapy program

Voropaiev Dmytro: [af.voropaev@gmail.com](mailto:af.voropaev@gmail.com)

## SKIING FOR THE DISABLED IN POLAND DURING 1970s

**ARKADIUSZ PŁOMIŃSKI**

*Jan Dlugosz University in Czestochowa*

The beginnings and development of the paralympic movement in Poland took place in the 1960s. In this period it was summer sports that were most popular among people with disabilities. As for winter sports hardly any people did skiing - only single individuals. Intensive development of skiing among the disabled in Poland was observed in 1970s. In this period Polish Championships began to be regularly organized and periodical training camps and instructor courses were held. In addition, Polish representatives took an active part in major international sports competitions. In 1974 seven skiers from Poland participated in the 1st World Skiing Championships of the disabled held in Cran-Gevier (France), where they won one bronze medal (Franciszek Tracz in the special slalom). Next, in 1976 disabled sportspeople took part in the 1st Winter Paralympic Games organized in the Swedish city of Örnsköldsvik. During the Games sportspeople from Poland competed in downhill (Alpine) competitions and cross-country (Nordic) skiing. In the downhill events from among the Polish national team the best result was achieved by Franciszek Tracz (class IVa), who in the special slalom was in the fifth place. Whereas in the cross-country skiing competitions the best results were achieved by Tadeusz Chwiejczak in class III.

Keywords: Winter Paralympic Games, skiing, disabled

Płomiński Arkadiusz: [a.plominski@ajd.czest.pl](mailto:a.plominski@ajd.czest.pl)

# ANALYSIS OF BODY COMPOSITION OF HATHA YOGA PRACTITIONERS

**WERONIKA GAWRYS, ANDRZEJ ŚLĘZAK**

*Institute of Health and Nutrition Sciences, Faculty of Management, Częstochowa University of Technology*

**Introduction:** Yoga is becoming increasingly popular and widely available form of physical activity. It is believed that yoga practice has a beneficial effect on the practitioner's body even with a small amount of exercise. There are also studies confirming the usefulness of yoga practice in the fight against obesity, which is a serious health problem of the 21st century. The aim of the study: Analysis of body composition of people who regularly practicing hatha yoga, analysis of the relationship between body composition and anthropometric parameters, as well as a comparative analysis with people not related to hatha yoga practice.

**Material and methods:** The study included 52 people who were divided into two groups. The group of hatha yoga practitioners consisted of 26 people aged 24-66, including 21 women and 5 men. The control group consisted of 26 people aged 23-64, including 21 women and 5 men. The body composition was performed using TANITA BC 420 SMA analyzer, which uses BIA method. Anthropometric measurements were made using the SECA 201 measuring tape. All participants completed the health assessment questionnaire.

**Results:** According to BMI standards, there was more people with normal body mass in yoga practitioners group, and there was no obesity in this group. The control group included people with both overweight and obesity. According to the body fat percentage (BFP) norms, yoga practitioners did not have increased BFP. In the control group, the upper limit of the norm was exceeded by 38% of respondents. Based on waist circumference standards (WC) in the group of people practicing yoga, 88% of people had the correct result, in the control group it was 50% of people, the rest had elevated WC. Interestingly, in the group of people exercising only 19% of people expressed their intention to reduce their weight, in the control group it was 69% of people.

**Conclusions:** The results show that people practicing yoga are characterized by normal body weight and waist circumference, and they have lower body fat content compared to non-practitioners. In addition, it can be stated that regular yoga practice contributes to a better body perception.

**Key words:** hatha yoga, body composition, obesity

Weronika.Gawrys: [veronika.gawrys@gmail.com](mailto:veronika.gawrys@gmail.com)

# THE IMPROVEMENT OF THE QUALITY OF LIFE THANKS TO PSYCHOSOMATIC EXERCISES

**AGNIESZKA KMIECIK, JANUSZ SZOPA**

*Academy of Physical Education in Katowice, Poland*

Almost every human being makes some demands for himself. If the demands are fulfilled, he treats his life as valuable. The requirements are often connected with one's body and mind and in many cases, they decide on the quality of life.

The quality of life of some post-graduate students of Relaxation and Yoga on the Academy of Physical Education in Warsaw and some participants of the hatha yoga training courses was researched. The quality of life before the yoga practice and after some time of practicing it was taken into consideration. The examined elements were: - frequency of stressful situations, - the way of perceiving outward appearance, - the way of breathing and its role in stress reduction, - the functioning of nervous system, - the way of feeling emotions, - body awareness, - endurance, - ability to concentrate, - general sensation, - kindness for people, - motor coordination, - ability to make choices, - self-discipline in action, - preferred values in life, - interest in working on self-development, - degree of empathy

The results of the research indicates that the hatha yoga practice has the positive influence on the quality of life of people who do such exercises.

Keywords: quality of life, hatha yoga, psychosomatic exercises

Janusz Szopa: [janusz.szopa@gmail.com](mailto:janusz.szopa@gmail.com)

# BARRIERS LIMITING THE ACCESS TO SPORTS AND RECREATION FACILITIES IN THE CITY OF POZNAŃ

**EWA KRUSZYŃSKA, JERZY EIDER**

*University of Szczecin, the Faculty of Physical Culture and Health Promotion, Szczecin, Poland*

The range of sports-recreation facilities' offer should be very wide in order for all social groups of the examined environment to have access to sports-recreation facilities. Therefore, Poznań City Hall should take into account all barriers that limit the access to these facilities when preparing management policy of sports and recreation infrastructure and its functioning.

The research carried out at indoor tennis courts (16 facilities), indoor swimming pools (12 facilities) and fitness clubs (11 facilities) in Poznań covered 1159 service recipients (using the services of a given sports and recreation facility).

The questionnaires were addressed to the service recipients (residents of the city of Poznań, who use the services offered at the examined sports and recreation facilities). Furthermore, the service recipients were divided into a group of people doing sports competitively and a group of recipients who have never practiced sports as professional athletes. In the questionnaire, the surveyed group of respondents could mark YES or NO answers, as well as express their level of satisfaction/evaluation with a grading scale from 1 to 10 (1-unsatisfied, 10-very satisfied).

The questionnaire sent to the examined service recipients included suggestions of barriers that may limit the access to sports and recreation facilities in the city of Poznań. Further analysis of the importance of barriers that limit the access to sports-recreation facilities may allow indicating the reason why recreational activity of residents is limited.

Keywords: sports-recreation offer, sports-recreation infrastructure, sports-recreational activities

Ewa Kruszyńska : [ewa.kruszynska@usz.edu.pl](mailto:ewa.kruszynska@usz.edu.pl)

# INDIVIDUAL SPORTS PROFILES OF CHILD ATHLETES AND NONATHLETES

**RÓBERT KANDRÁČ, MILAN TUREK, TOMÁŠ PERIČ, DALIBOR DZUGAS, MAREK KOKINDA, PETER KAČÚR, BEÁTA RUŽBARSKÁ, PETRA TOMKOVÁ**

*Faculty of Sports, University of Presov, Presov, Slovakia*

**Introduction:** The issue of talent selection and identification has been addressed by a variety of authors. However, few studies focus on sports recommended to be practiced by children on the basis of evaluating their performance or sports profiles.

**Methodology:** The purpose of the study was to determine individual sports profiles of child athletes and nonathletes and recommend sports to be practiced. The participants were children aged 6 and 7 years who were first graders at elementary schools. The children were divided into two groups: child athletes and nonathletes. Child athletes were children who participated in organized sports practice in soccer (n = 16), ice hockey (n = 29), artistic gymnastics (n = 10). Child nonathletes (n = 26) did not participate in any organized sports practice within extracurricular activities or in sports clubs. The study was conducted during the school year of 2017-18. Children performed a battery of 9 tests: sit-and-reach test, flexed arm hang (overhand grip), repeated routine with a stick, sit-ups, standing long jump, 4 x 10-meter shuttle run, rolling of three balls, 20-meter sprint, and endurance shuttle run. To assess decision-making processes, children played a chasing game called "pull-the-flag" game.

**Results:** As for the match between the sports practiced and the sports recommended to be practiced by child athletes, 20 children practiced the sports that were also recommended to be practiced on the basis of their individual sports profiles. According to their sports profiles, child nonathletes were recommended to do, in particular, rhythmic gymnastics, cycling, volleyball, tennis, and floorball.

**Conclusion:** We may conclude that low number of children practice sports that match children's motor dispositions. Therefore, individual sports profiles need to be devised to provide children with recommendations concerning sports that match their talent.

The study was supported by project VEGA 1/0997/16 "The structure of talent as a determinant underlying the evaluation of sports preconditions".

**Keywords:** Talent selection, Individual sports profile, Motor performance capacity

Marek Kokinda : [marek.kokinda@unipo.sk](mailto:marek.kokinda@unipo.sk)

# PHYSICAL ACTIVITY OF SENIORS AND CIVILIZATION DISEASES

**AGATA HORBACZ, IVETA CIMBOLAKOVÁ, ALENA BUKOVÁ**

*Pavol Jozef Šafárik University in Košice, Institute of Physical Education and Sport, Slovakia*

**Introduction:** In European society, in general, a person is considered a senior at his/her transition from working life to becoming retired. Increasing age gives rise to more frequent health problems. Many of them can be acted against purposefully through appropriate physical activity, which has a preventive effect on civilization diseases and facilitates the aging process. The work discusses physical activity of seniors in the context of civilization diseases. The study looks at the kinds of physical activity that senior citizens perform, how often they do so, and what civilization diseases they suffer from. The sample was composed of seniors (n = 70) aged  $72.03 \pm 5.9$  years. We divided the group to those exercising two or more times a week, under the supervision of an expert from a fitness and aerobics club, and a second group comprising pensioners from a pensioner's club in Košice, whose physical activity was restricted to short walks and irregular exercise.

**Material and Methods:** We were observing the weekly frequency, type and duration of their physical activity. Information regarding their current health condition and physical activity was collected by the means of Jones & Rose Questionnaire (2005). The data were statistically processed using MS Excel 2010 and Statistica version 12.

**Results.** More than 55% of the seniors reported that they performed physical activity two or more times a week, preferably aerobic exercises and swimming, at a duration of 60 minutes. The most frequent non-infectious civilization diseases seniors were suffering from are: high blood pressure (57.1%), osteoporosis (20%), peripheral vascular disease (12.9%) and diabetes (8.6%). Following splitting the cohort we found that the more active seniors group manifested lower incidence of peripheral vascular disease, osteoporosis and diabetes compared to the reference group of those only going for walks and doing exercise irregularly.

**Conclusion.** Several authors recommend physical activity for seniors organized under the guidance of well-educated and experienced instructors for whom the health of their trainee is important. Regular exercise positively affects not only physical health and the impact of civilization diseases, but also the quality of life of seniors.

**Keywords:** seniors, physical activity, civilization diseases

Agata Horbacz, email: [agata.horbacz@upjs.sk](mailto:agata.horbacz@upjs.sk)



# UTILIZATION OF EXPERT - DIGITAL TOOL FOR PHYSICAL ACTIVITY RECOMMENDATIONS FOR CARDIAC PATIENTS IN EASTERN SLOVAKIA

**ALENA BUKOVÁ, AGATA HORBACZ, DANA DRAČKOVÁ**

*University of P. J. Šafárik in Košice, Institute of Physical Education and Sport, Košice, Slovakia*

The aim of study is to evaluate the effectiveness of the prototype version of EXPERT digital tool, Module 1, applied to conditions of Eastern Slovakia, and to point out the problems regarding utilizing this tool in creating exercise recommendations for cardiac patients. The above digital tool is designed to prescribe exercises and generate recommendations on physical activity for patients with cardiovascular diseases. The study group comprised cardiac patients aged 40-75 years. The criterion for their inclusion was to have been diagnosed with one of the cardiological disease defined in advance. Results. Obtaining all the information needed in order to allow generating an exercise program using the online EXPERT tool required very close cooperation with medical doctors and nurses having access to basic patient information - patient characteristics, medical history, including chronic comorbidities not included in the CV, and drug interventions. The first problem faced at carrying out the research was willingness of the medical personnel to co-operate at time-consuming recording of the data in the online system. A further problem we encountered was lack of interest by the patients. Their indifference may have resulted from their reluctance to change their stereotype in any way, lengthy recording time of personal information or perhaps from insufficient motivating approach of the examiners themselves.

Based on patients' input data, a simple form was generated by Module 1 of the EXPERT tool defining 5 basic regulatory parameters: Frequency (F) and Intensity (I) of exercise, recommended Time of Load (T), optimum Duration of the Program, and the options for strenght training. Conclusion. On the basis of input clinical parameters, the digital tool was to create a customized profile leading to exact determination of appropriate and safe physical activities to be performed. However, Module 1 of the tool only offers general basic FITT (Frequency, Intensity, Time, Type) information, which is insufficient from the aspect of the patient, and can not be used in practice without a physical education specialist in cooperation with a clinical practitioner. For better patient awareness, it is preferable to use Module 2 of the system - a module designed for managing physical activity of the patient, not used at this stage of the research. Without Module 2, the results generated by Module 1 are vague and rather abstract. The study is carried out as part of the grant project VEGA-1/0825/17 "Recommendations for physical activities of risk groups and their adherence in Eastern Slovakia".

Keywords: cardiac patients, physical activities, recommendations, expert tool

Alena Buková: [alena.bukova@upjs.sk](mailto:alena.bukova@upjs.sk)

# BMI VS BFP AS A RELATION TO ESTIMATE THE PHYSIOLOGICAL SOCCER PROFILE

**ZERF MOHAMMED, BENGOUA ALI, MOKKEDES MOULAY IDRIS**

*Physical Education Institute Laboratory OPAPS, University of Mostaganem, Mostaganem, Algeria*

Background: in professional soccer, VO<sub>2</sub>max of 60 ml/kg/min is suggested as the minimum fitness requirement for male soccer players to play at an elite level (Almeida AMd, Santos Silva PR, Pedrinelli A, Hernandez AJ, 2018). Although obesity in terms of Fat percentage is a better parameter than BMI for the prediction of low VO<sub>2</sub>max (Mondal H, Mishra SP, 2017).

Objective: Based on the context, which confirms that the average maximal oxygen intake for elite adult players is reported to be in the range of 55 to 69 ml/kg/min (Manuel J. Coelho e Silva, António J. Figueiredo, Marije T Elferink-Gemser, Robert M. Malina, 2016). Present in this study as norms to test, which of the two fat indices estimate the adapted physiological soccer players profile.

Methods: 148 well-trained first division soccer players under 18 years, at the end of the preparatory phase before the start of the Algerian championship 2016-2017 took part in the study. Dived into two groups based on their VO<sub>2</sub>max  $\leq 56$  ml/kg/min  $\geq$ . As a protocol to estimate the impact of body fat percent (BFP) or fatness (BMI) on their physiological profile. Built on Test Cooper as predicted VO<sub>2</sub>max accepted as a physiological training response.

Results: The results show that VO<sub>2</sub>max of up to  $\geq 56$  ml/kg/min is an advantage of physiological training response than less among soccer players. Claim in the present via BFP as a superior better anthropometric index than BMI to predict the disadvantages of physiological training response relative to low VO<sub>2</sub>max among our players under 18years.

Conclusions: our protocol admits that training response in soccer game requests the use of more accurate systems, such as body fat percent index as a relation with VO<sub>2</sub>max to estimate the physiological adaptations of soccer training program correlated to its aerobics performance. Inspect in this study via VO<sub>2</sub>max up to  $\geq 56$  ml/kg/min as the minimum fitness requirement to enhance the player physiological soccer demand performance

Keywords: BFP, BMI, VO<sub>2</sub>max, physiological, soccer player.

Mohammed Zerf, email: [biomeca.zerf@outlook.com](mailto:biomeca.zerf@outlook.com)

# INFORMEDNESS OF DIABETES MELLITUS PATIENTS ABOUT THE EFFECTS OF PHYSICAL ACTIVITY IN PREVENTION AND TREATMENT OF THE DISEASE

JUNGER JÁN<sup>1,2</sup>, DRAČKOVÁ DANA<sup>1</sup>, MANKOVÁ SLAVOMÍRA<sup>1</sup>

<sup>1</sup>*Pavol Jozef Šafárik University in Košice, Institute of Physical Education and Sport, Slovak Republic*

<sup>2</sup>*University of Rzeszow, Faculty of Physical Education Rzeszow, Poland*

The aim of work was to extend knowledge about the awareness of patients with diabetes mellitus (DM) of the importance of physical activity (PA) in prevention and treatment of their diseases. Methods: The survey was carried out on 110 respondents, of which 47.3% were females and 52.7% males, while 69.1% of them were dependent on regular doses of insulin. The relevant and necessary information was collected in April 2018 by the means of a questionnaire handed over to patients directly at the Department of Diabetology and Internal Medicine at the Louis Pasteur University Hospital in Košice, Slovakia. The questions listed in the questionnaire were aimed at determining to what extent the patients are informed about their disease, i.e. whether they are aware of the procedures and treatments to be undertaken and of the medication to be provided. Results: The results showed that 40% of the patients expressed a negligent attitude towards active health care, 20% of them do not mean to undergo any change to improve their condition and 18.2% of them claim that they are lacking sufficient time to care for their health. Regarding the patients' awareness of their health condition, more than half of the respondents admitted having insufficient information of the kind and a similar number of them felt lack of knowledge of compensatory exercise for their illness. Worse still, as many as 69.2% of the patients reported inadequate help by the health care providers with regard to dos and don'ts in their disease, and 49.1% of those questioned reported having no knowledgeable health care provider to share their health problems with. The importance of PA in the prevention and treatment of DM is positively perceived by 69.1% of the patients. In terms of general engagement in physical activity, over one third of them prefer doing housework, 20% aerobic activity and 16.4% choose strength training. According our findings, PA qualified as intensive (lasting more than 30 minutes) is performed almost every day by 14% of the patients, 2-3 times a week by 20% and at least once a week by 27.3% of those involved. Summary: Based on the results obtained, it is conclude that a substantial number of DM patients admit lack of relevant information about their health condition and about the possibilities to improve it by either acting on their own initiative or getting advice or other such support from healthcare providers. On the other hand, the finding that nearly two thirds of the participants see regular PA as an option to achieve positive changes in this respect is optimistic. The study was conducted as part of VEGA grant project No. 1/0825/17 „Recommendations for physical activities of risk groups and their performance in Eastern Slovakia“.

Keywords: health, informedness, physical activity, patient, disease

Jan Junger: [jan.junger@upjs.sk](mailto:jan.junger@upjs.sk)

# INFLUENCE OF TYPOLOGICAL FEATURES OF THE NERVOUS SYSTEM ON INDIVIDUAL PERFORMANCE IN RUNNING FOR SHORT DISTANCES IN ATHLETES WITH VISUAL IMPAIRMENT ON THE EXAMPLE OF AN ELITE ATHLETE

ZHANNETA KOZINA<sup>1</sup>, OLENA CHEBANU<sup>1</sup>, OLENA REPKO<sup>1</sup>, SERGII KOZIN<sup>1</sup>, ANDREY OSIPTSOV<sup>2</sup>

<sup>1</sup>*Department of Olympic and Professional Sports and Sports Games, H. S. Skovoroda Kharkiv National Pedagogical University, Ukraine*

<sup>2</sup>*Department of Physical Education sport and human health, Mariupol State University, Ukraine*

**Introduction:** The purpose of the work is to theoretically and experimentally substantiate the influence of psychophysiological factors on individual performance in athletics sprint in high-qualified athletes on the example of an elite athlete. **Material and methods:** In this study, participated 1 athlete, 36 years of age, female. Athlete is specializing in short-distance running and long jump, the European Athletics Champion 2010; prize winner of the World Paralympic and Paralympic Games among athletes with visual impairments (T12 category) in 2016. The study was conducted for 5 months. Twice a week, testing was conducted (psychophysiological indicators and running speed); 36 tests of one athlete were conducted. Individual characteristics of the psychophysiological state and results in running for 100 m for five months were analyzed. **Results.** The models of multiple linear regression between results in 100 m run for an elite athlete with visual impairment and psychophysiological indices are compiled. High importance of psychophysiological indices in individual performance in running on 100 m is shown. **Conclusions.** Compensatory mechanisms of visual function deficiency were established to maintain high speed in the 100 m run as psychophysiological functions: indicators characteristic of sprinters (speed of simple reaction and motility of the nervous system) and specific indicators (efficiency, strength of the nervous system).

**Keywords:** sprint, track and field athletics, vision, limited possibilities, psychophysiological functions.

Zhanneta Kozina: [zhanneta.kozina@gmail.com](mailto:zhanneta.kozina@gmail.com)

# STATISTICAL ANALYSIS OF THE INFLUENCE OF TRACTION EXERCISES ON POSTURAL PARAMETER CHANGES IN UNIVERSITY STUDENTS

ERIKA LIPTÁKOVÁ<sup>1</sup>, MIROSLAVA BARCALOVÁ<sup>2,5</sup>, ALENA BUKOVÁ<sup>3</sup>, JOZEF ŽIVČÁK<sup>2</sup>, JAROMÍR ŠIMONEK<sup>4</sup>, VLADIMÍR HARČARIK<sup>5</sup>

<sup>1</sup>Technical University of Košice, Faculty of Economics, Department of Applied Mathematics and Business Informatics, Košice, Slovakia

<sup>2</sup>Technical University of Košice, Faculty of Mechanical Engineering, Department of Biomedical Engineering and Measurement, Košice, Slovakia

<sup>3</sup> University of P. J. Šafárik in Košice, Institute of Physical Education and Sport, Slovakia

<sup>4</sup> Constantine the Philosopher University, Faculty of Education, Department of Physical Education and Sport, Nitra, Slovakia

<sup>5</sup> Technical University of Košice, Department of Physical Education, Košice, Slovakia

**Introduction.** The paper presents results of a study analysing the impact of a specific exercise program - traction exercises for spiral stabilization of the spine (SPS) - on basic axial posture changes in university students.

**Methods.** The study group consisted of 26 students of Technical University in Kosice, Slovakia, aged 19-21 years. Exercise was performed throughout a whole semester (10 weeks), once a week in a form of 60-minute group exercise and 6-times a week in individual form over a shorter time interval (15 minutes), all under expert guidance. Postural parameters measurement (Shoulder Height Left, Shoulder Height Right, Shoulder 2 Shoulder Caliper, Neck Back Height, Neck Front Height) was performed using a non-invasive method, a full-body 3D scanner. The results of measurements performed before and after the exercises were analyzed by the means of descriptive statistics and paired t-test method. Interdependence between individual pairs of posture parameters was quantified by the Pearson correlation coefficient  $r$ .

**Results.** When evaluating changes in postural parameters following traction exercise, we can see improvement in all parameters monitored, except for Neck Back Height, where no statistically significant change was observed. What is more, a statistically significant positive relation was found between the changed values (before and after exercise) of the parameters Shoulder Height Left and Shoulder Height Right ( $r = 0.68$ ) and the parameters Shoulder Height Left and Shoulder 2 Shoulder Caliper ( $r = 0.56$ ).

The work was carried out as part of KEGA grant project No. 063TUKE-4/2016 "Metrological processing of biomedical data obtained by 3D scanners for educational purposes".

**Keywords:** posture, postural parameters, 3D scanner, SPS traction exercise

Alena Buková: [alena.bukova@upjs.sk](mailto:alena.bukova@upjs.sk)

## NORMS FOR KTK TESTS

**MÁRIA MAJHEROVA**

Faculty of Humanities and Natural Sciences of University in Presov, Slovakia

Different studies confirm the continuous decline in physical fitness in pre-puberty children. This is due to a lack of interest in physical activity, which does not support the healthy physical and mental development of children. Exercise programs that cover relatively the dominant areas of motor behavior can be an effective learning tool to be used with children. As part of our research, we have developed a model of movement games that are attractive to children. To assess the level of physical fitness, we selected the KTK test battery. We have created standards for individual tests. The study was conducted within VEGA project 1/0625/16

Keywords: motor abilities, younger school age

Mária Majherova: [maria.majherova@unipo.sk](mailto:maria.majherova@unipo.sk)

# ACUTE AND CHRONIC EFFECTS OF PASSIVE MUSCLE STRETCHING ON FOOTBALL PERFORMANCE

**MOKKEDES MOULAY IDRIS, BENGOUA ALI, ZERF MOHAMMED**

*Université de Mostaganem, département des sciences de l'entraînement sportif, IEPS, LABOPAPS, Algérie.*

**Purpose:** the static stretching used during the warm-up affect performance. This is very much discussed in the literature. The present study tries to see persistence during phases of games. The objective of the present study was to investigate the effects of passive stretching alone on subsequent agility, sprinting, and jump performance. So how can a static stretching technique used during warm-up affect athletic performance and does their effect persist during the play phases?

**Material & Methods:** two different stretching protocols: (a) static stretch (SS) to point of discomfort (POD); (b) a control warm-up condition without stretching were implemented with a prior aerobic warm-up and followed by dynamic activities

**Results:** The control condition showed significant differences ( $p = 0.05$ ) for all tests than the PS, condition. There were variable effects during the four phases of play. The performances were affected during the first time (D1), recuperation of muscular capacities in the second (D2), significant progresses in the third (D3) and stability with some perturbation in the last (D4).

**Conclusion:** The alterations induced by stretching can be attributed to the training state of the participants or the duration used after stretching. Based on these findings, highly trained individuals who wishes to implement static stretching should include an adequate warm-up and dynamic sport-specific activities with at least 15 or more minutes of recovery before their sport activity.

**Keywords:** passive stretching, football performance, acute and chronic effects

Mokkedes Moulay Idriss, email: [mi\\_mokkedes@hotmail.fr](mailto:mi_mokkedes@hotmail.fr)

# INFLUENCE OF ULTRAMARATHON ON THE HEALTH OF AMATEUR RUNNERS

MARTIN NOSEK<sup>1</sup>, ŠTEFAN BALKÓ<sup>1</sup>, JOSEF HEIDLER<sup>1</sup>, JAN ADAMEC<sup>1</sup>, DAGMAR PARTLOVÁ<sup>2</sup>, RADEK ZÁKON<sup>1</sup>, LUKÁŠ ŠAUER<sup>1</sup>, VANDA HRBKOVÁ<sup>1</sup>, VERONIKA MATOŠKOVÁ<sup>1</sup>

<sup>1</sup>Department of Physical Education and Sport, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republik

<sup>2</sup>Department of Clinical Biochemistry, Masaryk Hospital in Ústí nad Labem Czech Republik

**Objective:** The aim of this study was to investigate and evaluate the effects of long-term stress on muscle and heart biomarkers after passing 100 km ultramarathon run.

**Material & Methods:** For 9 amateur runners (average age 38.3 years  $\pm$ 10.2 years) who successfully passed ultramarathon at 100 km with an elevation of 3130m, samples of venous blood were examined before start, at the end immediately after the end of the race, one day after the race, than after 5 and 10 days after the race. Clinical, laboratory and somatometric data were obtained in all measurements. Blood samples were analyzed by biomarkers: amino-transferase (AST), cortisol, troponin T (cTnT), creatine kinase (CK) and C-reactive protein (CRP). In addition, were following the training experience and experience with ultramarathon. The monitored indicators were analyzed using ANOVA and Pearson r and the determinant r<sup>2</sup> at the significance level  $p < 0.001$ .

**Results:** The average run time of the runners was 13:55:40 (min: 12:12:35, max: 16:52:02). After passing the ultramarathon, runners showed a weight loss on average of 2.4 kg ( $p < 0.001$ ). The results show that hematological changes were caused by physiological stress and long-term strain. Significant exceeding of normal values occurred immediately after the race in 8 competitors of 9, at all studied biomarkers. AST enzymes significantly increased after the race (Pre race:  $0.593 \mu\text{kat/l} \pm 0,202$  vs. post-race:  $2.89 \mu\text{kat/l} \pm 3.2$ ,  $p < 0.001$ ) and indirectly correlated with training experience (Pearson  $r = -0.25$ ,  $r^2=0.06$ ,  $p = 0.02$ ) and achieved time at the finish (Pearson  $r = 0.67$ ,  $r^2=0.45$ ,  $p = 0.0001$ ). At the same time, competitors who had the best time at the finish and had the longest training experience, had the lowest levels CRP (achieved time Pearson  $r = 0.67$ ,  $r^2=0.45$ ,  $p = 0.02$ ; experience Pearson  $r = -0.24$ ,  $r^2=0.05$ ,  $p = 0.03$ ). Immediately after the race, 8 runners had an elevated blood cTnT of more than 50% (Post race:  $34.22 \text{ ng/l} \pm 25.9$ , max = 98 ng/l). After 24 hours, however, this condition has come to normal at all runners.

**Conclusion:** Long-term physical stress is associated with metabolic and cardiovascular changes. Blood abnormalities found in our study suggest that due to long-lasting extreme stress, it can cause heart fatigue. These changes did not have a long duration and after a few days, all runners returned to normal values. However, the long-term effect of these changes is still unknown.

**Keywords:** extreme running, heart, troponin, strain

Martin Nosek. email: [martin.nosek@ujep.cz](mailto:martin.nosek@ujep.cz)



# MEANINGFULNESS OF LIFE OF ATHLETE AND NON-ATHLETE UNDERGRADUATES

**PAVEL ŠMELA, PETRA PAČESOVÁ, STANISLAV KRAČEK**

*Comenius University, Faculty of Physical Education and Sports, Bratislava, Slovakia*

The aim of the study was to broaden the findings regarding meaningfulness of life of the athlete and non-athlete college students at universities in Bratislava. The research sample comprised of 198 undergraduates (males:  $n=90$ ,  $20.68\pm 1.56$  years of age; female:  $n=108$ ,  $20.74\pm 1.16$  years of age). The respondents were divided into 2 groups according to their sports activities: college students who do not take active part in any sports activities (non-athlete respondents), and college students who are engaged regularly (at least twice a week) in sport activities. The questionnaire The Scale of Life Meaningfulness was used as a research tool. The Kolmogorov-Smirnov test was used to evaluate data normality and Mann Whitney test was used to test significance of the differences between independent selections. Effect size was expressed by coefficient  $r$ . The results revealed significant differences in total score of meaningfulness of life by male ( $U=383.0$ ,  $p=0.000$ ,  $r=0.52$ ) and also female ( $U=687.5$ ,  $p=0.000$ ,  $r=0.45$ ). According to three-component model we have found out the significant differences between athlete and non-athlete college students in affective dimension (male:  $p=0.025$ , female:  $p=0.007$ ) and motivation dimension (male:  $p=0.000$ , female:  $p=0.000$ ). There were no significant differences in cognitive dimension (male:  $p=0.062$ , female:  $p=0.127$ ). According to our results which testified the fact that sport activity is one of the determinants for increased meaningfulness of life of undergraduates.

Keywords: meaningfulness of life, college students, sport activity

Pavel Šmela : [pavel.smela@uniba.sk](mailto:pavel.smela@uniba.sk)

# THE QUALITY OF LIFE OF DISABLED PEOPLE IN THE TOWN AND IN THE COUNTRYSIDE - RESEARCH REPORT

**DOROTA PAWLIK, KATARZYNA MIGACZ**

*The Academy of Physical Education in Katowice, Poland*

Quality of life is connected with social life, relationships and opportunities for success. Satisfaction with life is inextricably linked to the conviction that you are accepted by others. The way and type of functioning in society has a significant impact on the quality of life of people with disabilities. Disability disrupts the process of adaptation to life in society, the process of adaptation is long-lasting. During this time a person with a disability gets to know and becomes accustomed to the disability and learns how to overcome the difficulties resulting from it. Social integration allows for a dignified life for people with disabilities. It is nowadays stressed that disability is not a result of illness in itself, but above all is a consequence of social barriers faced by the person. These also include architectural, technical and communication barriers.

Quality of life is determined by many environmental factors. The sense of quality of life is influenced by variables such as social relations, financial conditions, social acceptance and employment. The obtained research results show that the functioning of people with disabilities depends on the environment in which they live.

All quality of life concepts emphasise the importance of work. The survey showed that 80% of respondents living in rural areas are not professionally active, which may not have a positive impact on their functioning. The questionnaire also included questions about social contacts, access to public transport or rehabilitation access. Generally, the results of the survey have indicated that the place of residence influences the assessment of the quality of life of the respondents.

Keywords: quality of life, disabled people, town, countryside

Dorota Pawlik: [filarowa1c@wp.pl](mailto:filarowa1c@wp.pl)

# INFLUENCE OF THE AUTHOR'S REHABILITATION PROGRAM WITH ELEMENTS OF YOGIC BREATHING ON THE LIFE QUALITY OF THE PATIENTS AFTER MYOCARDIAL INFARCTION

**SVITLANA INDYKA, NATALIA BIELIKOVA, NATALIYA ULIANYTSKA**

*Lesia Ukrainka Eastern European National University, Lutsk, Ukraine*

The evaluation of persons' life quality after myocardial infarction, temperament correction and intensity of their personal reactions to the disease are an integral part of the rehabilitation process. The goal of the research lies in the description of the effects of the author's rehabilitation program with elements of yogic breathing on the life quality of the patients after myocardial infarction in follow-up period.

Close upon 60 people who were in the phase of recovery after acute IM and had completed the full course of hospital treatment in heart disease department at Lutsk City Clinical Hospital took part in the research. The main group and the comparison group consisted of 30 male patients each formed by random sampling technique. The patients of the main and comparison groups took rehabilitation in specialized rehabilitation department at Lutsk City Clinical Hospital. People's age varied from 47 to 60, the average age in the main group was  $52.69 \pm 3.9$ , it was  $53.40 \pm 3.22$  in the comparison group.

The patients of the main group were engaged in the author's rehabilitation program; the comparison group took a cure of conventional rehabilitation scheme in Ukraine. The effectiveness of the rehabilitation programs was determined by the quality of live indicators through standardized method "Quality of Life in Cardiovascular Disease." As part of study found, the positive dynamics on the total life quality was observed in both groups of patients. It should be noted that 76.7% of patients in the main group hadn't considered their lives invalid by the end of the study. But only 60% of patients had this figure in the comparison group. The sources of patients' anxiety caused by this pathology were analyzed, and the tetrad of reasons that caused the maximum reduction in quality of life, was found out, namely: the need for treatment, restriction of physical efforts, and emotional stress, reduce vitality in daily life.

Keywords: myocardial infarction, rehabilitation program, life quality

Indyka Svitlana : [indika.sv@gmail.com](mailto:indika.sv@gmail.com)

# TAEKWON-DO TRAINING IMPROVES HEALTHY BEHAVIOURS AND SENSE OF BALANCE CONTROL DURING ADOLESCENCE

**JACEK WAŚIK, DOROTA ORTENBURGER, TOMASZ GÓRA, DARIUSZ MOSLER**

*Institute Physical Education, Tourism and Physiotherapy, Jan Dlugosz University in Czestochowa, Poland*

**Introduction:** As Taekwon-do contains various highly dynamic movement patterns, Taekwondo practice may sustain or improve many aspects health. Taekwon-do training improves healthy behaviours, balance control, speed, sensory organization of a children. The aim of this paper is to present the research answering if and how taekwondo have an influence on the elements on the level of healthy behaviours a children.

**Method:** The research covered the group of 34 taekwon-do ITF athletes. Standardized Inventory of Health Behaviours and our designed method ere applied. The presented research measures particular health behaviour based on the frequency of revealed behaviour types. The research was conducted by those who are familiar with the community of people practicing taekwon-do.

**Results:** The correlation between taekwon-do practice time and ability to do prolonged exercise was observed ( $p < 0.05$ ). All adepts noticed an increased balance control and ability to long lasting varied efforts.

**Conclusion:** The obtained results indicate that practicing taekwondo have an influence on everyday health-promoting behaviour, time spent in front of a TV, methods of spending free time, and the community in which free time is spent. The presented research was of an explorative character. Training TKD may improve many aspects health, sensory organization and balance ability in developing children and youth. The obtained data allow to make hypotheses that require further verification. More extensive research is required into the physical and physiological characteristics of taekwondo athletes to extend existing knowledge.

**Keywords:** adolescence, taekwon-do, health-promoting behaviour, sense of balance control childhood.

Dorota Ortenburger: [d.ortenburger@gmail.com](mailto:d.ortenburger@gmail.com)

# PHYSICAL AND MENTAL HEALTH COMPONENTS IN THE QUALITY OF LIFE OF STUDENT YOUTH

**VASYL PANTIK**

*Lesya Ukrainka Eastern European National University, Ukraine*

Introduction. The quality of life is a concept that is used in sociology, economics, politics, medicine and some other areas of science, that means the evaluation of a certain set of conditions and characteristics of human life, usually based on their own degree of satisfaction with these conditions and characteristics. That is, each person determines the quality of life personally, how she or he feels physically, emotionally, how is satisfied of well-being, work, friends, family, politics of the state, etc. In general, the quality of human life in modern researches is considered as an integral characteristic of its state, consisting of physical, psychological and social components. Methods and organization of research. In our researches, we used a non-specific MOS SF-36 questionnaire for avaluation of the quality of life, according to the procedure of the International Center for the Study of the Quality of Life of IQOLA, Boston, USA. In total, 1027 students of 1-4 years study at the Lesya Ukrainka Eastern European National University took part in pedagogical researches. Application of the SF-36 questionnaire allowed to obtain quantitative characteristics of the student youth quality of life, according to certain criteria. Research results. Our researches suggests that in girls self-assessing of the health state, 55.2% of them appreciated their health as "good," and 27.2% of young men recognized their health as excellent. No one young man described his health as unsatisfactory and only 9.0% of girls recognized it as such. As to the physical component of the student youth`s health, it is within the range of 52.17 points, and the mental health index is slightly lower – 42.27 points. These indicators testify for relatively low dynamics of young people health and the presence of problems in the life of respondents. The systematic mental overload of young people greatly affects the quality of life, because the mental component of the health of respondents is even lower than the physical one, which requires appropriate correctional programs. The results of studies have testified that there are statistical correlation relationships between role-based functioning, conditioned by the physical condition and role-based functioning also conditioned by the emotional state, the general state of health, vital activity, social and role functioning and mental health in general. Conclusions. The revealed statistical correlation relationships between the indicators of physical and mental components of health in the students` youth quality of life will create a personally oriented model of influence on the psychological and physical components.

Keywords: physical activity, quality of life, MOS SF-36, students.

Vasyl Pantik, email: [Ukraine.luck@gmail.com](mailto:Ukraine.luck@gmail.com)

# THE STATE OF THE PHYSICAL AND MENTAL COMPONENTS OF HEALTH IN THE QUALITY OF THE LIFE OF PEOPLE DOING FITNESS

**ANATOLII TSOS<sup>1,2</sup>, LUDMYLA VASHCHUK<sup>2</sup>, OLENA DEMIANCHUK<sup>2</sup>, OLENA TOMASHCHUK<sup>2</sup>, NINA DEDELIUK<sup>2</sup>.**

<sup>1</sup>Jan Dlugosz University in Czestochowa, Poland

<sup>2</sup>Lesya Ukrainka Eastern European National University, Ukraine

**Introduction.** The quality of the person's life is studied as an integral characteristic of his state which consists of physical and psychological components. Each component comprises separate elements, in particular, physical – the capability to do physical work, the ability for self-care; mental – anxiety, depression. behavior. The comprehensive study helps us determine the level of the quality of life of a person or definite social groups.

**The methods and organization of the research.** The international general survey MOS SF-36 was used to determine the indices of the quality of life. 513 students of Lesya Ukrainka Eastern European National University, Lutsk National Technical University and Kherson State University took part in the research. The participation in the research was voluntary and it didn't include any element of award. The choice of the educational institutions and groups of students was random.

**The results of the research.** The results show that the physical component of the students' health ranges from 49,6 to 54,3 points, the mental component ranges from 45,8 to 47,9 points (the maximum level is 100 points). These data tell us about low indices of health and problems in the respondents' life. The mental component of the respondents' health is lower than the physical component during their study. It requires special attention. The statistical correlation interrelations between the indices of the quality of the students' life were revealed.

**Conclusions.** The influence of the physical exercises upon the components of the health in the quality of the youth's life was determined. The indices of the physical and mental components in the quality of the life of the students doing fitness were shown to be higher than others. The received results show not only the morphofunctional influence of systematic fitness upon the organism but the person's psychoemotional state during the research.

**Keywords:** the quality of life, health, students, fitness.

Anatolii Tsos, email: [tsos.anatoliy@eenu.edu.ua](mailto:tsos.anatoliy@eenu.edu.ua)

# ADAPTATION OF THE CIRCULATORY SYSTEM TO EXTREME SPORTS TRAINING

**ANNA PILIS<sup>1</sup>, JAKUB KACPRZAK<sup>1</sup>, MICHAŁ ZYCH<sup>1</sup>, KRZYSZTOF STEC<sup>1</sup>, KAROL PILIS<sup>1</sup>, WIESŁAW PILIS<sup>1,2</sup>**

<sup>1</sup> *Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University, Czestochowa, Poland*

<sup>2</sup> *Department of Physiotherapy, Opole Medical School, Opole, Poland*

Long-term loading of the body with systematic physical effort leads to positive or negative adaptive changes in the circulatory system. Taking into account the above phenomenon, the present work examines the scope of adaptive changes in the circulatory system of a young man performing extreme physical efforts. Young man participated in this for 60 days who was performing extreme physical efforts consisting of fast walking or running for a distance of approximately 40 km, and then after 2-4 hour break fought 3-round bouts (each round lasting three minutes) sparring in a boxing match. Every day just after waking up (test I), then after completing daily physical exercise (test II) and before sleep (test III), systolic blood pressure (SBP) and diastolic blood pressure (DBP), heart rate (HR) and blood oxygen saturation (SaO<sub>2</sub>) were measured. Analysis of the dispersion of the obtained results showed that the SBP negatively correlated with the subsequent measurement days in test I, II and III ( $p < 0.01$ ;  $p < 0.05$ ;  $p < 0.001$ ). Similar interdependencies occurred in relation to DBP in studies I and III ( $p < 0.01$ ,  $p < 0.001$ ) and in the case of HR in studies I, II and III ( $p < 0.05$ ). On the other hand, SaO<sub>2</sub> significantly correlated in a positive way with the subsequent measurements performed in test I and III ( $p < 0.05$ ;  $p < 0.01$ ). In conclusion, systematic decrease of SBP, DBP and HR values and increase of SaO<sub>2</sub> in the following days of extreme training indicates the appearance of a positive post-workout adaptation in the young man's circulation system.

Keywords: physical training, blood pressure, heart rate, blood saturation

Karol Pilis : [k.pilis@ajd.czyst.pl](mailto:k.pilis@ajd.czyst.pl)

# NUTRITION AND SOMATIC VARIABLES OF FEMALE WEIGHTLIFTERS, SOCCER PLAYERS, TABLE TENNIS PLAYERS AND UNTRAINED WOMEN

**AGATA MROCEK<sup>2</sup>, WIESŁAW PILIS<sup>1,2</sup>, KRZYSZTOF STEC<sup>1</sup>, ANNA PILIS<sup>1</sup>, CEZARY MICHALSKI<sup>1</sup>, KAROL PILIS<sup>1</sup>**

<sup>1</sup> *Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University, Czestochowa, Poland*

<sup>2</sup> *Department of Physiotherapy, Opole Medical School, Opole, Poland*

Adequate nutrition and somatic conditioning considerably determine the sport's results. Therefore, the presented work is focused on monitoring these variables among sportswomen and untrained women. The study involved 51 women, including 12 weightlifters (WL), 15 soccer players (SP), 12 table tennis players (TT) and 12 control, untrained subjects (C). First the subjects basic data like age, body height (BH), body mass (BM), fat content (BF), lean body mass (FFM), body water content (TBW) and BMI index were recorded. Then, for 3 days, women recorded the quantity and quality of consumed foods. On this basis, the state of their daily nutrition was calculated. The examined groups of women did not differ in terms of age and somatic data as well as the energy value of the used diet, the amount of consumed water, proteins, fats and carbohydrates. After combining all women into one group, there were found significant negative correlation coefficients between the relative amounts of supplied energy, protein, carbohydrates and the following values: BM, absolute and relative BF, absolute FFM and TBW. In such a combined group, there were also positive correlations between the relative amounts of supplied energy, protein, carbohydrates, and FFM and TBW. In addition, the amount of drunk water correlated negatively with: BM, relative and absolute BF, and positively with the relative sizes of FFM and TBW. The correlations above described were present in part in the WL group and mainly in SP and TT, but were not observed in the C group. In conclusion irrational correlation coefficients between the amount of globally consumed energy and the energy value of proteins and carbohydrates consumed in a combined group of women (dominated by sportswomen) and the composition of the body indicate that somatic determinants of trained women are described not only by the nutrition but also by another factor, which is probably the level of physical activity. This seems to be indicated by the correlation coefficients described above, calculated separately for individual groups of surveyed women.

Keywords: nutrition, somatic conditions, women, sport

Karol Pilis : [k.pilis@ajd.czyst.pl](mailto:k.pilis@ajd.czyst.pl)



# YOGA AND RELAXATION AS A PART OF PUBLIC HEALTH: A REVIEW STUDY

**KRZYSZTOF STEC**

*Institute of Physical Education, Tourism and Physiotherapy, Jan Dlugosz University,  
Czestochowa, Poland*

Lifestyle diseases are a global problem. In terms of epidemiology, diabetes, hypertension, atherosclerosis, cancer, mental illness, obesity and others have increasing incidence. This is true even of countries which until recently preferred a traditional way of life. Technology, the pace of life, stress, and reduced physical activity affect the degradation of the health of societies across the globe. In Western societies, these factors have raised the demand for preventive and therapeutic antidotes to the adverse effects. Westerners turned to traditional yoga, which for the needs of Western civilization was modified, often distorting its essence. In its original nature *yoga* is a non-religious psycho-somatic system based on the laws of nature, inspiring the world of science by acting on a body integrated into the natural world. Related to yoga, Ayurvedic medicine impact on humans is associated with modern therapeutic methods, and accepted asanas [yogic postures] are a means of shaping the human psycho-somatic blueprint. In this way, yoga relaxes and strengthens physical movement, focusing particular attention to the mobility of the spine. It is also the perfect medium for achieving mental balance. These properties of yoga made it useful in the treatment of cancer, changes in the aging process of the body and achieving general welfare and well-being. More intense forms of yoga, including the ancient method of fitness called Suryanamaskar, became effective in the prevention and treatment of cardiovascular diseases, respiratory ailments and others. Yoga has already marked its significant impact on education systems and the military world.

Keywords: yoga; relaxation; public health; lifestyle diseases

Krzysztof Stec: [krisstec@gmail.com](mailto:krisstec@gmail.com)

# QUALITY OF LIFE AND HEALTH BEHAVIOURS OF PATIENTS WITH LOW BACK PAIN SYNDROME

WIOLETTA ŁUBKOWSKA, JUSTYNA KRZEPOTA

*University of Szczecin, Faculty of Physical Culture and Health Promotion, Poland*

**Aim.** The aim of this study was to assess the quality of life and health behaviours and to analyse the relationship between quality of life in relation to the level of health behaviours in the group of patients with low back pain (LBP).

**Material and methods.** The research was conducted on a sample of 52 patients with LBP (29 female and 23 male,  $M(\text{age})= 48.96\pm 15.86$ ). The tool used for assessing the quality of life was the Quality of Life Questionnaire (WHOQoL-BREF, Polish version), whereas the methodological basis for investigating health behaviours was the Health Behaviour Inventory (HBI). Differences in quality of life depending on the level of health behaviours were evaluated by means of the Kruskal-Wallis ANOVA. Relationships between the variables were analysed using the Spearman's rank correlation test. The level of statistical significance was set at  $p \leq 0.05$ .

**Results.** The analysis revealed that the General Index of Intensity of Health Behaviours (GIIHB) was high in 30.8%, average in 40.4% and low in 28.8% of the respondents. Statistically significant positive relationships were observed between: (1) Positive Thinking (HBI) and: Overall Quality of Life ( $R=0.42$ ), General Health ( $R=0.29$ ), Psychological domain ( $R=0.46$ ) and Environmental domain ( $R=0.44$ ); (2) between Proper Nutritional Habits (HBI) and Overall Quality of Life ( $R=0.38$ ), Psychological domain ( $R=0.28$ ), Environmental domain ( $R=0.30$ ); (3) between Health Practices (HBI) and: Overall Quality of Life ( $R=0.31$ ) and Psychological domain ( $R=0.28$ ); (4) between Preventive Behaviours (HBI) and two domains: Psychological domain ( $R=0.34$ ) and Environmental domain ( $R=0.34$ ). GIIHB for the respondents in general was a factor that significantly differentiated quality of life in Psychological domain ( $p=0.031$ ) and Environmental domain ( $p=0.026$ ).

**Conclusion.** In general, positive correlations concerning quality of life and health behaviours of the respondents were observed between the Psychological domain and all categories of health behaviours (HBI). Furthermore, positive correlations were found for Overall Quality of Life and Environmental domain with most of HBI categories. In light of these findings, it should be indicated that the focus during therapies for patients with LBP aimed to improve their quality of life should be on education in the field of health behaviours.

**Keywords:** quality of life, WHOQoL-BREF, health behaviours, low back pain, LBP

Wioletta Łubkowska , email: [wioletta.lubkowska@usz.edu.pl](mailto:wioletta.lubkowska@usz.edu.pl)

# FMS CONCEPT IN FOOTBALL TRAINING FOR CHILDREN AT 9-13 YEARS OF AGE.

**MARTA SZYMANEK-PILARCZYK**

*Uniwersytet Humanistyczno-Przyrodniczy im. Jana Długosza w Częstochowie*

Football is a sport in which direct contact with an opponent is permissible. In the discipline discussed most frequent injuries are those in the ankle and knee joints, which do not concern bruises or fractures only, but also ruptures or tears of ligaments and muscles. Such situation could take place during a play itself or during a training which we resume after a period of convalescence, or to which we are physically insufficiently prepared. Currently, there is a decline in the level of fitness in children. This phenomenon is visible in young footballers. The aim of this paper is to show whether systematic functional training improves mobility, symmetrical work in joints and periarticular muscle flexibility. FMS test is a tool which allows for the assessment of the level of performance and the control of the movement quality after doing appropriate functional training exercises. The tests were conducted among 80 players of the Football Academy of RKS Raków Częstochowa at 9-13 years of age. In all the groups tested in over 60% tests the number of people who scored maximum points in individual tests was reported to increase. The tests conducted showed the positive impact of functional training on the level of performance. A statistically significant difference was reported between the initial and control tests in all players. The introduction of such type of exercise should be an integral part of training football players.

Keywords: FMS test, efficiency of the locomotor system, functional training, football.

Marta Szymanek-Pilarczyk: [m.szymanek-pilarczyk@ajd.czyst.pl](mailto:m.szymanek-pilarczyk@ajd.czyst.pl)

# BMI AND SATISFACTION WITH LIFE OF FEMALE UNIVERSITY STUDENTS

**KLAUDIA ZUSKOVÁ, ZUZANA KÜCHELOVÁ**

*Pavol Jozef Šafárik University in Košice, Institut of Physical Education and Sport*

Unlike objective conditions, subjective quality of life is based on our own judgments about the conditions of a person's life. Subjective well-being (SWB) is an indicator of the subjective quality of life. This paper is based on the SWB concept of Edward Diener. SWB has four components while life satisfaction (LS) as a complex assesment of life satisfaction is its cognitive aspect.

Overweight and obesity relate to the quality of life of people with this health disorder. Only 2 to 5% of all cases of overweight or obesity have objective health causes. Others are unequivocally the result of an inappropriate lifestyle with an increased share of sedentary behaviour. The effects of obesity on physical health are quite clear, but its effect on well-being is less so. Representative US population surveys consistently point to the negative impact of overweight and obesity, but also underweight, on subjective health indicators.

Admission to college is a critical milestone in a person's life, usually at the end of adolescence and early adulthood. Lifestyle changes that occur during the transition from high school to university are a reduction in physical activity, increased alcohol intake, smoking, a worsening of diet.

The sample of cross-sectional research in the grant project VEGA no. 1/1343/12 "Selected Risk Factors of Obesity and Prevention through Physical Activity " was created from 978 first year students of two universities in Slovakia. We obtained the data in field conditions using the 5-item scale of life satisfaction (SWLS, Diener et al., 1985),  $\alpha = 0.80$  and measuring the body weight and height, from which we determined BMI (Body Mass Index) according to WHO.

The results show significant differences in LS within the BMI bands in favor of the negative relationships between the observed variables.

We recommend physical activity as a compensation in risk prone undergraduate students with increased BMI values. At the same time, this activity may be a mediating factor toward higher life satisfaction.

Keyword: subjective well-being, life satisfaction, Body Mass Index

Kludia Zusková: [kludia.zuskova@gmail.com](mailto:kludia.zuskova@gmail.com)

# DEVELOPMENT OF BOXING IN THE DĄBROWA BASIN IN THE PERIOD OF THE PEOPLE'S REPUBLIC OF POLAND

**DANIEL BAKOTA**

*Jan Dlugosz University in Czestochowa*

The Dąbrowa Basin was established in the 19th century. It is a social and economic area located in the southern Poland. The time periods of the paper cover the years 1945-1989. The initial date is marked by 1945. It was then that under the act of unconditional surrender of the Third Reich signed on 7 May 1945 in Reims (the act entered into force on 8 May 1945), World War II ended in Europe. In turn, the closing date is marked by 1989 - the beginning of the political transformation in Poland. The basic research method used when writing the paper was the analysis of historical sources with elements of deduction and induction inquiry. In the period discussed on the territory of the Dąbrowa Basin boxing sections operated in Będzin (RST "Jedność"), Dąbrowa Górnicza (Workers' Sports Club "Zagłębie"), Sosnowiec (Regional Military Draft Office "Kolejarz") and in Zawiercie ("Włókniarz"). Their activity was under the responsibility of the Silesian Regional Boxing Association.

Keywords: boxing, sport, Rural Sports Teams, the Dąbrowa Basin

Daniel Bakota: [danbak@autograf.pl](mailto:danbak@autograf.pl)

## PHYSIOLOGICAL ASPECTS OF HATHA YOGA EXERCISES

**MARZENA JAWORSKA**

*Academic Yoga Association, Częstochowa, Poland*

Hatha yoga exercises are the form of kinesthetic recreation which main aim is to improve one's physical health. In the consequence of training, different physiological reactions appear, mainly in circulatory, respiratory, motor(muscular), endocrine, neuromuscular and nervous systems of our body. Among people who regularly do exercises we may observe:

- blood pressure drop, - beneficial effect of exercises on cardiovascular system,
- improvement of cardiovascular fitness, - keeping the correct body weight and reducing the excessive one, - improvement of stamina, - improvement of physical fitness and physical efficiency, - enhancement of bony density, reducing the risk of fractures, - strengthening joints and improvement in their functioning, - improvement of periarticular tissues flexibility,
- improvement of muscles strength and endurance, - improvement of lighness,
- improvement of motor coordination, - improvement of bad posture, - positive role in glucose metabolism, - positive influence on lipids activity, - improvement of intestines functioning, - beneficial influence on immune system, - improvement of brain cognitive functions, - positive influence on emotional balance, - improvement of one's well-being,

Hatha yoga, when practiced regularly, decreases the appearance of arterial hypertension, osteoporosis, faulty postures, rachialgia, contracture, injuries, disability, excess weight, infections of airways, constipation, emotional disorder, depression, hebetude syndromes, metabolic disorders, hypercholesterolaemia, diabetes. Because of the possibility of individual approach to practice, the hatha yoga training can be done regardless of age, gender or state of health. Practicing hatha yoga is a crucial element of healthy lifestyle. It causes the improvement of psychophysical health and has an essential influence on the improvement of one's life.

Keywords: yoga, flexibility, physical health, kinesthetic recreation

# Wpływ 2-miesięcznego stosowania nakładki na fotel samochodowy – ERGOsmile, na stan kręgosłupa w odcinku lędźwiowym wśród zawodowych kierowców.

KAROL LESZCZYŃSKI<sup>1</sup>, PAWEŁ ZĄBEK<sup>2</sup>

<sup>1</sup> *Institute of Physical Education, Tourism and Physiotherapy, Jan Długosz University, Czestochowa, Poland*

<sup>2</sup> *Ergosmile Sp. Z.o.o*

**Introduction:** Wykonywanie zawodu kierowcy wiąże się z wielogodzinnym spędzaniem czasu w jednej wymuszonej pozycji, wibracje i wstrząsy powodowane ruchem samochodu. Kierowca w trakcie jazdy ma ograniczone możliwości aktywności fizycznej oraz rozluźnienia napiętych mięśni i stawów. Z kolei konstrukcje foteli, szczególnie samochodów klas niższych, często nie zapewniają właściwego podparcia szczególnie narażonej na dolegliwości części lędźwiowej kręgosłupa.

**Material and Methods:** Opierając się na modelu budowy anatomicznej człowieka, warunkach pracy za kierownicą oraz analizie konstrukcji foteli samochodowych została opracowana nakładka wspomagająca utrzymanie anatomicznej postawy podczas jazdy samochodem. Wykorzystując metodę ankietową dokonano badania na grupie 50 kierowców, którzy pokonują rocznie średnio 21 000 km.

**Results:** Nakładka wpływa pozytywnie na komfort jazdy kierowców. 80% z nich zauważyło poprawę komfortu jazdy, natomiast 83% stwierdziło zmniejszenie dolegliwości bólowych w odcinku lędźwiowym o ponad 1pkt w skali VAS. Z kolei 64% kierowców odczuło poprawę skuteczności trzymania bocznego, a 20% zauważyło niższe pocenie się skóry pleców.

**Wnioski:** Otrzymane wyniki wskazują, że zmiana podparcia kręgosłupa poprzez zastosowanie nakładki pozwala kierowcom zwiększyć komfort jazdy. Zmniejsza też objawy bólowe związane z uciskiem niektórych nerwów, niewłaściwego ustawienia kręgosłupa w płaszczyźnie strzałkowej, oraz wymuszonej nienaturalnej pracy mięśni. W dalszej perspektywie przewiduje się zmniejszoną ilość zmian zwyrodnieniowych i przeciążeniowych u osób stosujących nakładkę w porównaniu z grupą, która tego nie robi.

**Keywords:** Zdrowie, Profilaktyka, zaopatrzenie ortopedyczne, kręgosłup