

**INŠTITÚT FYZIOTERAPIE, BALNEOLÓGIE A LIEČEBNEJ  
REHABILITÁCIE V PIEŠŤANOCH**

**Univerzita sv. Cyrila a Metóda v Trnave**

**Abstrakty**

z vedecko-odbornej konferencie s medzinárodnou účasťou

**PIEŠŤANSKÉ FYZIOTERAPEUTICKÉ DNI**



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# PIEŠŤANSKÉ FYZIOTERAPEUTICKÉ DNI

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# PIEŠŤANSKÉ FYZIOTERAPEUTICKÉ DNI

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# ZÁKLADNÉ POJMY BALNEOLÓGIE A BALNEOTERAPIE

## BASIC CONCEPTS OF BALNEOLOGY AND BALNEOTHERAPY

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### **Abstrakt:**

Balneológia je náuka o liečení prírodnými na určité miesto viazanými liečebnými zdrojmi, o účinkoch prírodných zdrojov na ľudský organizmus a o kúpeľných liečebných metódach . Balneoterapia je liečba prírodnými liečivými zdrojmi .Je to súhrn konkrétnych liečebných postupov používaných v mieste príslušného prírodného liečivého zdroja. Liečba prebieha vždy pod lekárskym vedením. Balneológia má tisícročnú tradíciu a historicky patrí k najstarším klinickým medicínskym odborom. Práca zahŕňa prehľad najstarším foriem balneoterapie až po súčasnosť. Poukazuje na vplyv osobnosti ,ktoré sa zapísali do histórie tohto odboru vo svetovom meradle. Autori v práci ďalej popisujú prehľad prírodných liečivých zdrojov, nešpecifické a špecifické účinky balneoterapie a princípy kúpeľnej starostlivosti.

**Kľúčové slová:** balneológia, balneoterapia, kúpeľná starostlivosť

### **Abstract:**

Balneology is a science of treatment with native healing sources and science about its healing effects and methods. It is a complex of concrete medical advances used by native healing sources. The treatment is always controlled by a balneology medical specialist. Balneology has a long, more than one thousand years long history and belongs to the oldest medical disciplines. The article involves the overview of different forms of balneotherapy from history till present time, and remarks the historic agency of important balneology specialists in hole word. The authors consecutively describe the types of native healing sources, nonspecific and specific effects of balneotherapy as well as the principles of spa treatment.

**Key words:** balneology, balneotherapy, spa healing care

# **FUNCTIONAL TEST OF DYNAMIC STABILITY IN OVERWEIGHT ADULTS**

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## **Introduction**

The ability to move the centre of gravity voluntarily and keep the balance is fundamental for performing mobility tasks. As a functional test of dynamic stability, the maximum voluntary inclined posture can be evaluated. At first glance, inclined posture may seem unnatural, but maintaining the centre of body mass near the limits of stability occurs very often in daily activities. Measuring stability or instability in these positions can provide important information about balance control. We focused on the assessment of limit of postural stability by voluntary forward leaning because consequences of overweight should be more evident on dynamic stability than on static equilibrium.

## **Methods**

Twenty-five overweight and obese adults (9 F, mean age  $32.5 \pm 1.2$  yrs, mean height  $173.6 \pm 1.7$  cm, mean BMI  $32.4 \pm 0.9$  kg.m $^{-2}$ ) and 25 normal weight adults (9 F, mean age  $32.4 \pm 1.2$  yrs, mean height  $174.2 \pm 1.8$  cm, mean BMI  $22.4 \pm 0.3$  kg.m $^{-2}$ ) participated in the study. Participants were instructed to maintain an upright standing position, after hearing the sound signal subjects were asked to lean forward. Each trial lasted 10 s and was repeated 3 times. The subjects stood on custom-made force platform. Centre of foot pressure (CoP) data in anterior-posterior direction were sampled at 100 Hz. Several variables were extracted from CoP signal: amplitude of limit of stability in forward direction (average of steady-state lean position of CoP displacement), amplitude of oscillations and mean CoP velocity during leaning phase. A movement analysis system (BTS Smart DX, Italy) with sampling frequency 100 Hz recorded the kinematics of body segments. We evaluated the leg and the trunk

segment angles with respect to the vertical. Data were evaluated with MATLAB programs. One-way ANOVA with post hoc LSD comparisons was used as statistic method.

## **Results**

We observed the increased amplitude of oscillations of steady-state lean position and increased mean velocity of leaning phase in overweight group. The functional limit of stability was not significantly different between groups. The analysis of voluntary inclined posture showed significantly lower angle of leg and increased trend in trunk angle in overweight group.

## **Conclusions**

The increase of amplitude of oscillations and mean velocity suggest that an adaptive strategy in maintaining dynamic stability is accepted in overweight subjects. Significant difference in leg angles likely showed that overweight subjects reduced leg alignment and used more commonly trunk flexion during inclination. This could be concluded as indication that excessive body mass influence the kinematic strategy of postural movements, which are in direction away from optimal vertical posture.

**Key words:** dynamic stability, functional test, overweight, kinematic strategy,

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# ASSESSMENT OF HUMAN BALANCE DURING QUIET STANCE BY POSTUROGRAPHY AND ACCELEROMETRY

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## Introduction

Balance impairment seen in elderly represents a risk factor for falls and subsequent injuries. Age-related pathologies, e.g. Parkinson's disease, hinder independent mobility and lead to postural instability. Common method for assessment of the human balance is posturography based on recording of the centre of pressure displacements (CoP). Recently, the interest and usage of accelerometry for measurement of body segments tilts have increased. The goal was to investigate quiet stance in conditions with reduced sensory information and find out how these methods reflect changes of quiet stance due to age and Parkinson's disease (PD).

## Methods

We examined 13 healthy older adults (5 men, mean age  $70.5 \pm 4.2$  yrs) and 13 patients with PD in early stage (H&Y score 1-2, 6 men, mean age  $63.7 \pm 6.1$  yrs) during quiet stance under

four static conditions: stance on a firm and foam surface, with eyes open and closed. We evaluated amplitude, velocity in anterior-posterior and medial-lateral directions and root mean square from CoP displacement and from lower (AccL5) and upper (AccTh4) trunk tilts.

## **Results**

Deficit of sensory information led to an increase of analyzed parameters values from CoP displacement and trunk tilts in both groups. We found significant differences in CoP between healthy elderly and patients during the stance on foam surface with eyes closed. During the stance on firm surface, groups were significantly distinguished by velocity and amplitude of upper and lower trunk tilts in medial-lateral direction.

## **Conclusion**

Our results showed that accelerometers placed at the trunk provided useful information about balance control and could reliably indicate balance impairment due to Parkinson's disease. Accelerometric sensors are small, light and they can be easily attached to different body segments. They represent unobtrusive, accurate, inexpensive and portable way of body sway measures. Detailed analysis of body sway and trunk tilts appears to be important for understanding of ageing and its undesirable complications, such as falls. We suggest using accelerometry as supplementary method of posturography to examine balance control also in clinics and rehabilitation.

**Key words:** quiet stance, posturography, accelerometry, balance control

This work was supported by the Slovak Research and Development Agency under the contract No. SK-AT-2015-0031 and by VEGA grant No. 2/0094/16.

# **CHANGES IN BREATHING PATTERN ASSOCIATED WITH POSTURAL IMPROVEMENT DURING BIOFEEDBACK**

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## **Introduction**

Respiration is a periodic perturbation to body balance by altering trunk volume. Postural control effectively compensates for this predictable perturbation in healthy people. However, the movements associated with respiration still have minimal, but not negligible effect on postural sway, which should be taken into account in rehabilitation process. The real-time visual biofeedback (VF) from centre of pressure (CoP) during a standing task represents challenging condition, when postural activity may interfere with breathing. It was hypothesized that breathing will be altered in order to achieve improvement of postural stability during the visual biofeedback balance task.

## **Methods**

Fifty young healthy subjects (26 F, mean age  $28.0 \pm 3.7$  yrs) were tested in two conditions: 1) stance on foam surface, 2) stance on foam surface with visual VF based on CoP. Amplitudes of CoP in anterior-posterior and medial-lateral directions were measured by the force platform. Breathing movements were recorded by two pairs of 3D accelerometers attached on both lateral sides of lower chest in midaxillary line at the level of half distance between xiphoid process and umbilicus.

## **Results**

Balance improvement due to VF was documented by the reduction of CoP amplitudes in both directions compared to control condition. The reduction of postural sway was accompanied with significant decrease of lower chest (abdominal) breathing and increase of breathing frequency during VF condition compared to control condition.

## **Conclusion**

The results showed that disturbing effect of breathing on postural sway can be automatically suppressed in order to improve balance during sensitive control of postural equilibrium. Along with the reduction of postural sway, breathing movements were suppressed and the breathing frequency increased during biofeedback condition. These changes in breathing pattern were probably activated in order to maximize balance improvement. Knowledge about the relationship between respiration and postural control is crucial for planning targeted therapy focused on improving balance and breathing functions.

**Key words:** postural sway, breathing, biofeedback, postural control

This work was supported by the Slovak Research and Development Agency under the contract No. SK-AT-2015-0031 and by VEGA grant No. 2/0094/16.

# **USING OF ACCELEROMETERS FOR RECORDING OF RESPIRATORY MOVEMENTS DURING QUIET STANCE**

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## **Introduction**

In standing posture, respiratory movements constitute an internal perturbation to body balance by altering the trunk volume. Insufficient coordination between postural and breathing functions of diaphragm can lead to breathing or stability problems, which may negatively influence the quality of life. The aim of this study was to find out, if small light-weighted inertial sensors positioned on the opposite sides of the chest can reliably sense breathing movements during stance.

## **Methods**

Fifty healthy subjects (26 F, mean age  $28.0 \pm 3.7$  yrs) participated in the study. They were asked to stand quietly on the foam support surface with eyes open. Two pairs of

accelerometers were placed on sternum at the level of 4<sup>th</sup> ribs (AccSter), on the 4<sup>th</sup> thoracic vertebra (AccTh4), and on both lateral sides (AccR, AccL) of lower chest (midaxillary line at the level of half distance between xiphoid process and umbilicus). Upper chest breathing (UCB) was calculated as a difference between AccSter and AccTh4 amplitudes of accelerations. Lower chest breathing (LCB) was determined as a difference between AccR and AccL amplitudes of accelerations. Differences between UCB and LCB were analyzed using repeated measures ANOVA with post-hoc pairwise comparison with Bonferroni adjustment. The breathing frequency was measured also by spirometry.

## **Results**

Our results confirmed the significant effect of positioning the accelerometers on the chest for effective recording of breathing movements. LCB was significantly increased compared to UCB, i.e. breathing cycles were more reliably distinguished in lower chest. Calculation of breathing frequency (i.e. amount of breathing cycles) recorded by accelerometers was proved by the values determined by spirometry.

## **Conclusion**

Findings from our study showed that abdominal breathing movements could be reliably recorded by a couple of accelerometers attached to the proper places on the lower chest. This opens new possibilities for using inertial sensors in clinical practice and rehabilitation. Close relationship between respiration and postural functions of diaphragm and abdominal muscles is crucial for planning targeted therapy focused on improving balance and also breathing.

**Key words:** respiration, postural functions, breathing movements, targeted therapy

This work was supported by the Slovak Research and Development Agency under the contract No. SK-AT-2015-0031 and by VEGA grant No. 2/0094/16.

# **MAXIMAL ISOMETRIC FORCE OF BACK MUSCLES IN SPORT ACTIVE AND SEDENTARY POPULATION**

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Study compares maximal force and force gradient of isometric deadlift in group of 43 physically active (PAP) 43 (average age  $22 \pm 1.9$  years; weight  $79.6 \pm 8.6$  kg; height  $181 \pm 5.8$  cm) and 37 sedentary people (SP) (average age  $20.5 \pm 2.1$  years; weight  $82.3 \pm 14.8$  kg; height  $182.1 \pm 7.9$  cm). Participants performed two trials of 5 sec isometric deadlift with maximal effort. The results showed significant difference ( $t=0.000$ ) between maximal isometric force between group PAP ( $3207.9 \pm 506$  N) and group SP ( $2586.2 \pm 453.3$  N). On the other side, there was significant difference ( $t=0.000$ ) in force gradient at all monitored phases of isometric deadlift, specifically 100 ms (PAP  $19.4 \pm 5.3$ ; SP  $7.5 \pm 4.5$  N/m.s), 200 ms (PAP  $15.1 \pm 6$ ; SP  $6.5 \pm 3.8$  N/m.s) and 300 ms (PAP  $11 \pm 6.5$ ; SP  $5.1 \pm 2.7$  N/m.s).

The insufficient strength of back erector muscles is one of the most common reasons of lower back pain. It follows, that physically active men have significantly stronger back muscles than sedentary men, regardless if they perform muscular fitness or other sports.

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**Key words:** isometric force, back muscles, lower back pain

# **APLIKACE MODERNÍCH TRENDŮ V RÁMCI SPECIALIZOVANÉHO EDUKAČNÍHO PŘÍSTUPU KE KlientůM S VÍCENÁSOBNÝM POSTIŽENÍM**

**MODERN TRENDS APPLICATION IN SPECIALIZED EDUCATIONAL APPROACH IN  
CLIENTS WITH MULTIPLE DISABILITIES**

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## **Abstrakt:**

Cílem příspěvku je seznámit odbornou veřejnost s výsledky případových studií aplikace moderních trendů, zahrnutých do terapie dětí s vícenásobným postižením a jejich limity. První část je zaměřena na Interaktivní projekci, při níž se aktivizuje mobilita, lokomoční schopnosti, rozvíjí se spontánní pohybová produkce a dochází k uplatnění nově naučených pohybových vzorců. Také dochází k rozvoji kognitivních schopností - pozornosti, paměti a především zrakového vnímání. Výzkumný soubor tvořilo 71 respondentů s diagnózou DMO a vícenásobných postižení ve věku 2-18 let, kteří byli zahrnuti do studie po dobu 3 měsíců. Studie se účastnilo 8 výzkumníků z řad speciálních pedagogů. Metodou sběru a analýzy dat byly dotazníky, hodnotící míru spokojenosti na intervalové škále a dotazníky s otevřenými otázkami. Druhá část příspěvku se zabývá vlivem vibrací pomocí rezonančního lůžka na navození celkového tělesného uvolnění jedinců s vícenásobným postižením a na změny ve vnímání tělesného schématu vzhledem k druhu svalového napětí u těchto jedinců. Do případové studie bylo zařazeno 50 respondentů ve věku 1-17 let po dobu 6 měsíců. Na terapii se podíleli 2 výzkumníci z řad speciálních pedagogů. Metodou sběru dat byly dotazníky s polouzavřenými otázkami, metoda zúčastněného pozorování a rozboru poznámek. Získaná data byla zpracována pomocí analýzy četnosti. Závěrečná část je věnována AKKA platformě ve spojení s multisenzorickými vjemy, které působí nejen motivačně, ale zároveň stimulují kognitivní schopnosti. Autorka příspěvku se snaží poukázat na nové metody, koncepty a terapie vhodné pro jedince všech věkových kategorií bez ohledu na typ a stupeň somatického

postižení či přidružených vad.

**Klíčové slova:** interaktivní projekce; vícenásobné postižení; rezonanční lůžko; AKKA platforma.

**Abstract:**

The aim of this contribution is to familiarize the professionals with the results of case studies concerning the application of modern trends included in the therapy of children with multiple disabilities and their limits. The first part is focused on Interactive projection, which activates mobility, locomotion ability, develops spontaneous movement and production and apply newly learned movement patterns. It leads also to the development of cognitive skills - attention, memory and especially visual perception. The research sample consisted of 71 respondents diagnosed with cerebral palsy and multiple disabilities aged 2-18 years who were enrolled in the study over a period of 3 months. The study was attended by eight researchers from the ranks of special education teachers. The method of data collection and analysis where questionnaires evaluating the satisfaction rate on the interval scale and questionnaires with open questions. The second part deals with the influence of vibration on the total body relaxation and the influence of changes in perception of the body image due to the kind of muscle tension in individuals with multiple disabilities by the using of the resonance bed. The research group was consisted of 50 children aged 1–17 years for the duration of 6 months. Two researchers from the ranks of special education teachers participated in the therapy. Methods of data collection were questionnaire with semi-closed questions, the participating observation and analysis of the notes. Obtained data were processed by the analysis of frequency. The final part is dedicated to the AKKA platform in connection with multisensory stimulation, which has positive effect not only on motivation but also on stimulation of cognitive abilities. Author of this contribution tries to show new methods, concepts and therapies suitable for people of all ages regardless of the type and degree of disability or associated somatic defects.

**Key words:** interactive projection; multiple disabilities; resonance bed; AKKA platform.

# **HYPOCHOLESTEROLEMICKÝ A ANTIATEROGÉNNY ÚČINOK**

## **HYPOLIPIDEMIC AND ANTI-ATHEROGENIC EFFECT OF SOME PREBIOTICS - EXPERIMENTAL STUDY**

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### **Abstrakt:**

**Úvod:** Kardiovaskulárne a onkologické ochorenia predstavujú v industrializovaných krajinách hlavný zdravotnícky problém, a sú hlavnou príčinou morbidity a mortality. Karcinóm hrubého čreva patrí k najčastejším zhoubným nádorm a predstavuje jednu z hlavných príčin úmrtia na nádory vôbec. Súčasné poznatky dovoľujú považovať zvýšené hladiny krvného cholesterolu za významné riziko pre vznik aterosklerózy. Prevenciu možno považovať za jednu z hlavných metód kontroly procesov aterogenézy i kancerogenézy, a diétne faktory patria k jedným z najvýznamnejších súčastí tejto prevencie.

**Ciel:** Cieľom bolo prostredníctvom štúdií chemicky indukovaných modelov uvedených ochorení na pokusných zvieratách prispieť k hľadaniu potenciálne rizikových či protektívnych faktorov výživy, použiteľných v nutričnej prevencii či terapii uvedených ochorení. Vyskúšali sme aj možnosť uplatnenia modelu spoločnej nutričnej stratégie pri prevencii aterosklerózy a karcinómu hrubého čreva suplementáciou diéty odpadovými zdrojmi vlákniny (výlisky ovocia a zeleniny).

**Materiál a metódy:** Ako model experimentálnej aterosklerózy sme použili nutričný model s hypercholesterolovou diétou so samcami potkanov kmeňa Wistar. Modelom

experimentálnej kancerogenézy bolo použitie DMH (1,2-dimethylhydrazín hydrochlorid). Preparáty sme spracovali štandardnou formol-parafínovou technikou.

**Výsledky a záver:** Z našich výsledkov vyplýva, že prebiotiká efektívne znižovali hladinu sérového cholesterolu a mierne protektívne pôsobili na rozvoj nádorov hrubého čreva. Je zaujímavé, že výrazne antilipoperoxidačný efekt vlákninových produktov nemal žiadnu súvislosť s aktivitami antioxidačných enzýmov ani s najvýznamnejším intracelulárnym antioxidantom – GSH.

**Kľúčové slová:** morfologia, prebiotiká.

**Abstract:**

**Introduction:** Cardiovascular and oncological diseases belong to the major medical issues in the industrialized countries. It represents the main reason of morbidity and mortality. Colon cancer is one of the most frequent malignant tumors. It is considered to be one of the main causes of tumor death at all. Based on the current knowledge, the increased level of blood cholesterol is responsible for the significant risk for atherosclerosis. Prevention represents one of the main methods of controlling the processes of atherogenesis and carcinogenesis. Moreover, dietary factors belong to the most important parts of this prevention.

**Aim:** Aim of the study which used the chemically induced models of the mentioned diseases in experimental animals was to investigate the potential risks and protective factors of nutrition used for the nutrition prevention and therapies. We have applied model of common nutritional strategy to prevent atherosclerosis and colon carcinoma by supplementing the diet with waste fiber sources (moldings fruit and vegetables).

**Material and Methods:** As model of experimental atherosclerosis, the nutritional model of hypercholesterolemia diet on male Wistar rats was used. The basis of experimental carcinogenesis was the application of DMH (1,2-dimethylhydrazine hydrochloride). Preparations were processed by standard formalin-paraffin technique.

**Results:** Our results show that prebiotics effectively reduce the level of serum cholesterol and have a mild protective effect on the development of colon tumors. It is interesting to know that there was no significant association between antilipoperoxidizing effect of the fiber products and the activities of antioxidant enzymes neither the most important intracellular enzymes antioxidant - GSH.

**Key words:** morphology, probiotics

# **PROFESIJNÉ ETICKÉ KÓDEXY VO FYZIOTERAPII**

**PROFESSIONAL ETHICAL CODES IN PHYSIOTHERAPY**

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## **Abstrakt:**

Profesijné etické kódexy sú v súčasnosti jedným z najvýznamnejších prostriedkov regulácie konania a správania človeka v určitej skupine, profesii, organizácii. V živote každého zohráva dôležitú úlohu etický štandard, ktorý od neho požaduje jeho profesia, či pracovné zaradenie. Zámerom príspevku je preto teoretické uchopenie problematiky etických kódexov vo fyzioterapii ako regulátorov konania.

**Kľúčové slová:** etický kódex, etické pravidlá, profesijná etika

## **Abstract:**

Professional Ethical Codes are currently one of the most important means of regulating the behaviour and behaviour of a person in a particular group, profession, organization. Each person's life plays an important role in the ethical standard that demands his or her occupation or job classification. The aim of the contribution is therefore the theoretical grasp of ethical codes in physiotherapy as regulators.

**Key words:** ethical code, ethical rules, professional ethics

# PRÁŠKOVÁ METALURGIA TITÁNU PRE BIOMEDICKE APLIKÁCIE

POWDER METALLURGY TITANIUM FOR BIOMEDICAL APPLICATIONS

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## **Abstrakt:**

Najnovší vývoj a výskum v oblasti titánu (Ti) a Ti kompozitov na Slovensku založený na práškovej metalurgii prípravy je v článku popísaný a zhodnotený a následne je diskutované možné využitie týchto nových progresívnych materiálov v biomedicínskych a zdravotníckych aplikáciách.

**Kľúčové slová:** prášková metalurgia, titan, biomedicínske aplikácie

## **Abstract:**

The development in Slovakia during last year's in the field of titanium (Ti) and Ti composite research based on powder metallurgy is reviewed and possible usage of the new developed materials in biomedical and healthcare applications is discussed.

**Key words:** powder metallurgy, titanium, biomedical applications

# KONZERVATÍVNA LIEČBA TOS Z POHLADU FYZIOTERAPEUTA

CONSERVATIVE TREATMENT TOS FROM THE PHYSIOTHERAPIST POINT OF  
VIEW

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## **Abstrakt:**

## **Úvod**

Do skupiny cievnych ochorení patria aj kompresívne syndrómy, pri ktorých dochádza k cievnej symptomatológií. Syndróm hornej hrudnej apertúry (Thoracic outlet syndróm ) je jedným z najznámejších syndrómov patriacich do tejto skupiny. Prvé správy o tomto kompresívnom syndróme sú v literatúre udávané na konci 19.storočia. Frekvencia výskytu TOS je udávaná rôzne od 3 do 80 ochorení na 1000 jedincov. Neurogénne príznaky sú v častosti výskytu na prvom mieste, ďalej arteriálne a nemenej časté sú príznaky venózne. K útlaku ciev a nervov dochádza najmä pri určitých pohyboch ramien a hlavy.

Medzi najčastejšie vrodené anomálie patrí nadbytočné krčné rebro a predĺžený priečny výbežok krčného stavca. Hypotrofia svalstva ramenných pletencov alebo naopak hypertrofia pri nadmernom preťažovaní horných končatín prípadne aj niektoré druhy športov alebo zamestnaní môžu vyvolať symptomatológiu TOS. V poslednej dobe sa väčšina pracovísk zaoberajúcich sa chirurgickou liečbou TOS zhoduje v názore, ktorý preferuje využitie všetkých možností komplexnej rehabilitačnej liečby pred primárny chirurgickým riešením.

## **Metodika - kazuistika**

V krátkosti prezentujeme kazuistiku 50 ročnej pacientky s TOS l.sin. neurogénny a arteriálny typ. Predstavíme rehabilitačnú terapiu a vhodné preventívne opatrenia pri konzervatívnom liečení TOS. Dôležitú úlohu zohráva dobrá spolupráca fyzioterapeuta s pacientom a

dodržiavanie odporučených opatrení. Fyzioterapia spočíva v korekcii nesprávneho držania tela a analyzovaním nesprávnych pohybových stereotypov a svalových dysbalancií.

Fyzioterapia musí byť navrhnutá individuálne na základe klinického vyšetrenia pacienta.

Nezastupiteľné miesto má manuálna terapia, mobilizácia klúčnej kosti, postizometrická relaxácia a antigravitačná relaxácia na m. pectoralis a m. trapezius, strečing, nácvik správneho dýchania a ošetrenie trigger points v oblasti m. pectoralis minor terapiu môžeme doplniť aj vhodnou fyzikálnou terapiou.

**Záver:** Rehabilitačná terapia pri TOS môže výrazne pomôcť zlepšiť kvalitu života pacienta.

**Klúčové slová:** Thoracic outlet syndrom, fyzioterapia, kompresívne syndrómy

### **Abstract:**

**Introduction:** Compression syndromes to vascular diseases and they are largely distinguished by vascular symptomatology. Thoracic outlet syndrome (TOS) is very well defined. First reports on the compression syndrome in the literature have been recorded in the end of the 19th century. The incidence of the TOS varies between 3-80 cases of 1000 subjects. Neurogenic symptoms are in the frequency in the first place, and proportion of arterial and venous symptoms is similar. The compression of blood vessels and nerves is caused by the narrow space of the thoracic outlet and it emphasized especially in certain movements of the arms and head. Congenital anomalies include excessive cervical rib and elongated transverse process of cervical vertebra very often can cause neurovascular compression. Symptomatology of TOS can be caused among other things by the hypotrophy or conversely hypertrophy of shoulder girdle muscles. Excessive overloading of the upper extremities or even some kinds of sports or occupations may be causing this disease. Recently, most departments involved in the surgical treatment of TOS use of all possibilities of comprehensive rehabilitation before the primary surgical option.

### **Methodology - Case Report**

We present a case report of 50-year-old female with left TOS in combination with neurogenic and arterial type of symptomatology. We have introduced rehabilitative therapy and appropriate precautions in the conservative treatment of TOS. Good cooperation between the physiotherapist and patient and patient's compliance are very important.

Physical therapy consists of correcting of the incorrect posture and incorrect analyzing movement patterns and muscle dysbalance. Physiotherapy must be designed individually based on clinical examination of the patient. Manual therapy, mobilization of clavicle, isometric relaxation and antigravity relaxation of pectoral and trapezius muscles, stretching, proper breathing drill, treating of trigger points in minor pectoral muscle can be complemented by the appropriate physical therapy.

**Conclusion:** Rehabilitation therapy of the TOS can significantly help to improve the quality of life of the patient.

**Key words:** Thoracic outlet syndrome, compression syndromes, physiotherapy.

# **POSTOJ ZAMESTNANCOV ÚRADOV VEREJNÉHO ZDRAVOTNÍCTVA K POHYBOVEJ AKTIVITE**

ATTITUDE OF EMPLOYEES OF PUBLIC HEALTH AUTHORITIES TOWARDS  
PHYSICAL ACTIVITY

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*RNDr. Ladislava Wsólová PhD.*

*doc. PhDr. Mgr. Róbert Ochaba, PhD., MPH*

*Úrad verejného zdravotníctva Slovenskej republiky, Bratislava*

## **Abstrakt:**

## **Úvod**

Pravidelná pohybová aktivita je základom zmeny životného štýlu, pomáha prekonať ďalšie zmeny, najmä nutričné, nefajčenie a zvládanie stresu. Pravidelná pohybová aktivita zvyšuje fyzickú pracovnú kapacitu, alebo zdatnosť, definovanú ako „schopnosť vykonávať pohybovú aktivitu na miernej až ľažkej úrovni bez nadmernej únavy a spôsobilosť udržať si takúto schopnosť počas celého života.

## **Súbor a metodiky**

Dotazníkový prieskum, Chí kvadrát test v kontingenčných tabuľkách, dvoj výberový dvojstranný t test, neparametrický dvoj výberový dvojstranný Mannov-Whitneyov test, neparametrický Kruskal-Wallisov test, pracovali sme na hladine významnosti  $\alpha = 0,05$ , použili sme štatistický softvér IBM SPSS 19.

## **Výsledky**

Dotazníky boli vyplnené pracovníkmi úradov verejného zdravotníctva v období od 9. 12. 2014 do 26. 1. 2015. Súbor pozostáva z 1607 respondentov, 210 mužov (13,1 %) a 1397 žien (86,9 %) vo veku od 21 do 75 rokov s mediánom 49 rokov. Počet odpracovaných rokov sa pohyboval od 0 do 27 rokov s mediánom 20 rokov. Pracovné zaradenie bolo najčastejšie zdravotnícky pracovník (62,02 %), nasledovalo zaradenie odborný (nezdravotnícky) pracovník (33,1 %) a technicko-hospodársky pracovník (11,9 %). Pokiaľ ide o športovú

aktivitu, 49,3 % respondentov udáva prechádzky, 28,7 % rekreačný šport a 15,7 % nešportuje vôbec. Športová aktívita respondentov je štatisticky významne ovplyvňovaná pohlavím, vzdelaním a vekom ( $p < 0,001$  pre všetky tri premenné). Ženy sa štatisticky významne menej venujú vrcholovému a rekreačnému športu v porovnaní s mužmi ( $p < 0,001$ ). Čím sú respondenti vzdelanejší, tým je väčší podiel športujúcich rekreačne a menší podiel nešportujúcich. Respondenti, ktorí sa venujú vrcholovému (medián veku 34) alebo rekreačnému športu (medián 46), sú štatisticky významne mladší ako respondenti, ktorí chodia na prechádzky (medián 51) alebo nešportujú (medián 52). Respondenti, ktorí sa venujú rekreačnému športu, majú štatisticky významne nižší BMI (medián 23,2) ako respondenti, ktorí chodia na prechádzky (medián 24,7) alebo nešportujú (medián 25,5). Frekvencia športovej aktivity je štatisticky významne ovplyvňovaná pohlavím, vzdelaním a vekom ( $p < 0,001$  pre všetky tri premenné).

## Záver

Ženy venujú športovej aktívite menej času ako muži, nielen bežne v živote, ale aj pri zvládaní stresu. Ženám pri odbúravaní stresu pomáha viac ako mužom relax, dovolenka, rodina a hudba. Čím sú respondenti mladší, tým viac času venujú športovej aktívite. Medzi hlavné odporúčania opatrení pre vyšší záujem o pohybovú a športovú aktivitu patrí predovšetkým orientácia na ženy, starších ľudí a ľudí s nižším vzdelaním.

**Kľúčové slová:** rizikové faktory, životný štýl, stres, pohybová aktívita

## Abstract:

### Introduction

Regular physical activity is the basis for lifestyle change, it helps to overcome other changes, especially nutritional, non-smoking and manage stress. Regular physical activity increases physical work capacity or fitness, which is defined as the “ability to perform physical activity on a mild to severe level without excessive fatigue and the capability to maintain this ability throughout life”.

### Sample and Methodology

Questionnaire survey, Chi-squared test, two-sample two-sided t test, nonparametric two-sample two-sided Mann Whitney test, nonparametric Kruskal-Wallis test. We worked at a significance level  $\alpha = 0,05$ . We used statistical software IBM SPSS 19.

## **Results**

The questionnaires were completed by employees of public health authorities from 9 December 2014 to 26 January 2015. The sample consists of 1607 respondents, 210 men (13,1%) and 1397 women (86,9%) aged from 21 to 75 years with the median 49 years. The number of years worked ranged from 0 to 27 years with median 20 years. The most frequent job category was health worker (62,02 %) followed by professional (non-health) worker (33,1%) and technical - economical worker (11,9%). As far as sport activity is concerned, 49,3% of respondents report walks, 28,7% of respondents report recreational sports and 15,7% do not practise any sport at all. Sport activity of the respondents is statistically significantly affected by gender, education and age ( $p<0,001$  for all three variables). Women are statistically significantly less involved in professional and recreational sports than men ( $p <0,001$ ). The more educated were respondents, the bigger was number of the respondents engaged in recreational sports and the smaller number of respondents not practising any sport. Respondents who are involved in professional (median age is 34 years) or recreational sports (median 46 years) are statistically significantly younger than those who walk (median 51 years) or do not practise any sport (median 52 years). Respondents who are engaged in recreational sports have statistically significantly lower BMI (median 23,2) than respondents who walk (median 24,7) or do not practise any sport (median 25,5). The frequency of sport activity is statistically significantly influenced by gender, education and age ( $p <0,001$  for all three variables).

## **Conclusion**

Women spend less time on sport activities than men, not only in everyday life, but also in managing stress. Relax, holiday, family and music help more women than men in relieving stress. The younger the respondents, the more time they spend on sport activities. One of the main recommendations for action for greater interest in physical and sport activity is to focus on women, older people and people with lower education.

**Key words:** risk factors, lifestyle, stress, physical activity

**Zborník abstraktov**  
z vedecko-odbornej konferencie s medzinárodnou účasťou  
**PIEŠŤANSKÉ FYZIOTERAPEUTICKÉ DNI**

**Zostavovatelia zborníka:**

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Vydala Univerzita sv. Cyrila a Metoda v Trnave, 2017

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