

## ORIGINAL STUDIES

### **Interdependence between quality of life, clinical and isokinetic results in knee osteoarthritis patients with joint replacement indication**

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*Background.* Knee osteoarthritis is present in approximately 10% of the general population and its prevalence is even higher in former athletes. Clinical scores in knee osteoarthritis emphasize range of movement, stability and pain and do not include muscle strength assessment. It has already been shown that muscle imbalance and especially extensor deficiency is responsible for many symptoms, including pain and instability, and thus strongly influences the quality of life.

*Aims.* To evaluate the isokinetic strength of the knee in advanced osteoarthritis patients and to correlate it with clinical and life quality scores.

*Methods.* 20 patients with knee osteoarthritis in surgical stage, representing Patient Group (PG) were compared with 14 healthy subjects of comparable age (Control Group CG). Clinical examination was performed using the Hospital for Special Surgery (HSS), Knee Society (KS) and Patellar scores. Quality of life was assessed by the Short Form 36 Health Questionnaire. Isokinetic evaluation of knee extensor and flexor muscles was performed by a Gymnex Iso 2 Dynamometer at angular velocities of 60°/s and 120°/s.

*Results.* There were statistically significant differences between patients and controls regarding clinical scores (HSS, KS, Patellar Score). Quality of life was significantly worse in PG for 3 aspects: physical functioning, physical role limitation and bodily pain. Peak torques at 60°/s and 120°/s were significantly lower in PG than in CG for both extension and flexion. Correlation analysis of isokinetic data and clinical and quality of life scores, respectively, revealed statistically significant, but low correlation coefficients.

*Conclusions.* Before knee arthroplasty muscular testing has to be performed in parallel with clinical and life quality assessment and corrective muscular strengthening performed.

**Keywords:** total knee arthroplasty, muscular strength, isokinetic, quality of life, osteoarthritis.

# **Antioxidant complex supplementation and aerobic exercise capacity in rats**

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## **Abstract**

*Background.* Protection from oxinitrosative stress can be provided by dietary antioxidants and the supplementation with various antioxidant preparations that under exercise conditions can contribute to the maintenance of exercise capacity and post-exercise recovery. We chose a preparation with a complex antioxidant formula: vitamins, fruit and plant extracts, patented lycopene, grape and olive extracts.

*Aims.* The effect of antioxidant complex supplementation on the aerobic exercise capacity of rats was monitored.

*Methods.* The groups were divided as follows: group I - exercise trained; group II - exercise trained and supplemented with an antioxidant complex; group III - loaded with 15% of weight and exercise trained; group IV - loaded with 15% of weight, exercise trained and supplemented with an antioxidant complex. Aerobic exercise capacity was measured using the running test.

*Results.* Antioxidant supplementation and moderate intensity physical exercise cause a significant increase in aerobic exercise capacity compared to physical exercise of the same intensity without supplementation. Antioxidant supplementation and high intensity physical exercise induce a significant increase in aerobic exercise capacity compared to physical exercise of the same intensity without supplementation.

*Conclusions.* Antioxidant supplementation and high intensity physical exercise determine a significant decrease in aerobic exercise capacity compared to moderate intensity physical exercise with and without antioxidant supplementation.

**Keywords:** physical exercise, antioxidants, rats.

# **Pre- and post-surgery changes in the quality of life of patients receiving total hip arthroplasty**

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## **Abstract**

*Background.* Coxarthrosis is an important health problem due to the reduction of the patients' quality of life, to pain and other associated disturbances, before and after surgery.

*Aims.* The aim of the current study was to investigate the evolution of pain and the degree of functionality of the hip in the pre- and post-surgery phases in patients undergoing total hip arthroplasty. The second aim of the study was to analyze how the patients' expectations for postoperative pain, stress and anxiety affect their quality of life.

*Methods.* The study participants (N=55) were selected from patients hospitalized at the Rehabilitation Hospital Cluj-Napoca. The mean age of patients was  $m=62.84$  ( $sd=11.18$ ), with a mean BMI  $m=27.18$  ( $sd=2.4$ ). Assessment tools: the Visual Analogue Scale as an instrument that measures any continuous psychological variable that cannot be measured directly; the Quality of Life Assessment Scale, adapted version for the Romanian population, using the Health Status Questionnaire survey.

*Results.* A significant reduction in pain, anxiety and stress was found after surgery ( $p<0.05$ ). There was an improvement in all characteristics assessed by the Quality of Life Assessment questionnaire in the post-surgery phase, data showing an increase in physical and mental functioning.

*Conclusions.* There were visible post-surgery reductions in pain, anxiety and stress. Anxiety and pain were reduced immediately after THA surgery, but the stress level did not change significantly between the two post-surgery assessment phases. In the post-surgery phases, the General Health Status was positively influenced by changes in VAS parameters, inducing an increase in physical and mental functioning.

**Keywords:** hip arthroplasty, quality of life, postoperative pain, Harris score.

# **The correlation between the augmentation index and walking capacity in patients with peripheral arterial disease, with and without intermittent claudication**

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## **Abstract**

*Background.* The need to establish a strategy for the evaluation of patients with atherosclerosis and peripheral arterial disease (PAD), based on the knowledge of correlations between different parameters that characterize the disease.

*Aims.* Analysis of the correlation between functional parameters and arterial stiffness parameters in patients with peripheral arterial disease of the lower limbs, with and without symptoms of claudication.

*Method.* In 46 patients with atherosclerosis and PAD with and without intermittent claudication, diagnosed by detecting an ankle-arm index less than or equal to 0.9, we determined the augmentation index as a measure of arterial stiffness and ability to walk, by determining the distance walked for 6 minutes, during April-May 2012. The Pearson method was used for linear regression analysis and the threshold of statistical significance chosen was  $p \leq 0.05$ .

*Results.* Between patients with stage I (no claudication) and those with stage II (claudication), significant differences in terms of augmentation index ( $32,54 \pm 6,61$  to  $40,66 \pm 7,46$ ;  $p=0.0004$ ), 6 minute walk test ( $383 \pm 22,90$  vs  $312 \pm 54,48$ ,  $p=0.0001$ ) and ankle-arm index ( $0.77 \pm 0.01$  vs  $0.60 \pm 0.080$ ,  $p=0.001$ ) were discovered. There was a weak correlation between the augmentation index and the 6 minute walk test in the 46 patients with PAD (index of determination  $R^2=0.40$ ). However, if patients were divided into two subgroups according to sex, the correlation between the two variables significantly increased: in women:  $R^2=0.62$ ,  $p=0.001$ , in men:  $R^2=0.67$ ,  $p=0.001$ . The augmentation index was significantly higher in women than in men ( $40,76 \pm 8,48$  to  $34,33 \pm 6,76$ ,  $p=0.006$ ), while there were no significant differences in the other measured parameters.

*Conclusions.* In patients with PAD with claudication, the augmentation index as a measure of arterial stiffness is higher and the walking ability is lower than in those who do not have claudication. There is a correlation between the two parameters, which significantly increases if the two sexes are examined separately, while the augmentation index is higher in women than in men.

**Keywords:** arterial stiffness, walking ability, peripheral arterial disease.

## **Evolution of muscular strength after total knee arthroplasty**

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### **Abstract**

*Background.* Knee osteoarthritis is a very common joint disorder and the leading indication for knee replacement surgery. Knee osteoarthritis and, consequently, knee arthroplasty are even more frequent in athletes. Total knee arthroplasty successfully alleviates pain and improves function in knee osteoarthritis people, but muscular deficit may persist long term after the intervention. How impairments change over the first 6 months from the isokinetic point of view has not yet been well studied in the literature.

*Aims.* To measure changes in muscular strength from before to 6 months after total knee arthroplasty and to compare outcomes with data from a control group consisting of healthy adults.

*Methods.* The study was a prospective cohort trial including 17 patients undergoing TKA, recruited from 3 orthopaedic departments in Cluj-Napoca, who were compared to 11 healthy adults. Patients' assessment was performed preoperatively, as well as at 1, 2 and 6 months postoperatively, by the isokinetic method. Healthy adults were assessed once by the same method. Isokinetic evaluation of knee extensor and flexor muscles was performed using a Gimnax Iso 2 dynamometer. After a warm-up protocol, measurements were done at angular velocities of 90 and 180 degrees/sec. Statistical analysis was carried out using Microsoft Excel 8.0 for Windows and Epiinfo version 3.5.3.

*Results.* Patients performed significantly worse at all times ( $p < 0.05$ ) for both extension and flexion, compared to healthy adults. One month postoperatively, patients experienced significant losses in extensor strength from preoperative levels, recovered back to preoperative levels by six months, but never reached values of healthy adults.

*Conclusions.* Persistent muscle impairments 6 months after knee replacement suggest that more intensive rehabilitation should be recommended to restore function to the levels of healthy adults.

**Keywords:** total knee arthroplasty, muscular strength, isokinetic, rehabilitation, osteoarthritis.

## **In vitro effects of 100 mJ/cm<sup>2</sup> UVB radiation on some normal skin cells (Note I)**

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### **Abstract**

**Background.** The melanocytes and keratinocytes form a close association in the skin named melano-epidermal unit. This is capable of secreting a wide range of signaling molecules in response to different stimuli, such as stressors or ultraviolet radiation (UVR). Potential targets for these secretor products are keratinocytes, fibroblasts and mast cells; therefore, melanocytes may act as regulatory cells, with a role in the epidermal homeostasis. Grapes, particularly red, contain a large diversity of polyphenolic compounds exhibiting antioxidants properties; they might offer protection against UV radiation in skin cells.

**Aims.** The aim of our study was to evaluate the in vitro effects of UVR – B type induced oxidative stress on cellular viability of melanocytes and keratinocytes and to evaluate the protective antioxidant role of a grape seed extract (GSE).

**Methods.** Experiments were conducted on the following groups: individual cultures of keratinocytes, individual cultures of melanocytes, keratinocyte-melanocyte co-cultures. For each of these the following subgroups were made: control (irradiated, unprotected by BMR); exposed to UVB (irradiated); protected by BMR and then exposed to UVB. The radiation dose used was 100 mJ/cm<sup>2</sup>/cell culture.

**Results.** UVB radiation induced a prooxidative status, materialized in cellular death. The most sensitive were individually cultured keratinocytes, followed by cells from co-cultures. BMR is a natural antioxidant factor for the immediate protection of cultured cells viability against oxidative stress generated by exposure to UVB radiation.

**Conclusions.** BMR extract exerted an effective antioxidant protection on individually cultured keratinocytes and on cell co-cultures.

**Keywords:** cell cultures, oxidative stress, cell viability, antioxidants.

## ***In vitro* effects of 500 mJ/cm<sup>2</sup> UVB radiation on some normal skin cells (Note II)**

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### **Abstract**

**Background.** Our observations regarding the effect of exposure to 100 mJ/cm<sup>2</sup> ultraviolet radiation (UVBR) on the viability of epidermal cells in isolated cultures of keratinocytes and melanocytes and co-cultures, respectively, and the protective antioxidant effect of Burgund Mare Recaş (BMR) grape seed extract determined us to study the influence of exposure to 500 mJ/cm<sup>2</sup> UVBR of the same cells under identical conditions.

**Aims.** We aimed to study: a) the effect of experimental oxidative stress by exposing cell cultures to UVB radiation (500 mJ/cm<sup>2</sup>/cell culture) and the effects on cell viability; b) the protective antioxidant effects of Burgund Mare Recaş (BMR) grape seed extract on cell viability.

**Methods.** Experiments were conducted on the following *groups*: individual cultures of keratinocytes, individual cultures of melanocytes, keratinocyte-melanocyte co-cultures. For each of these the following *subgroups* were made: control (nonirradiated, unprotected by BMR); exposed to 500 mJ/cm<sup>2</sup> UVBR; protected by BMR and then exposed to UVBR.

**Results.** Exposure of cell cultures to 500 mJ/cm<sup>2</sup> UVBR induced an increased prooxidant status, with cell death; the most affected were individually cultured keratinocytes, followed by cells in co-cultures; the application of the natural antioxidant BMR is a factor for the immediate protection of cultured cells against oxidative stress generated by irradiation.

**Conclusions.** BMR extract exerted an effective antioxidant protection on individually cultured keratinocytes, and also on cell co-cultures. Melanocytes in interaction with keratinocytes react *in vitro* as a local sensor to stress. Cell viability after irradiation with a 500 mJ/cm<sup>2</sup> dose is lower than that after irradiation with 100 mJ/cm<sup>2</sup>.

**Keywords:** cultures of cells, keratinocytes, melanocytes, UVB radiation, oxidative stress, antioxidants.

# **Anxiety and salivary cortisol modulation in exercise induced stress, using a phytotherapeutic product containing *Rhodiola Rosea***

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## **Abstract**

*Background.* Phytotherapeutic products may influence the effect of stress on anxiety and salivary cortisol.

*Aims.* The objective of the study is to highlight the phytotherapeutic modulation of dynamic peri -stress changes induced by intense short duration physical exercise on two parameters (anxiety and salivary cortisol), in sedentary subjects.

*Methods.* The chosen subjects (n=24) were selected according to the requirements of the study. Stress was represented by intense short duration physical exercise, made with a Monark Ergonomic 839E cycle ergometer. The analyzed indicators were anxiety and salivary cortisol. The phytotherapeutic product (PP) used contained *Rhodiola Rosea*. Statistical evaluation was made on the basis of Student test.

*Results.* Anxiety and salivary cortisol were reduced immediately pre- and post-stress in subjects who were administered the PP, compared with subjects who did not follow the phytotherapeutic treatment.

*Conclusions.* 1) Anxiety and salivary cortisol were significantly reduced immediately pre- and post-exercise, in the case of stress caused by intense short duration physical exercise, in sedentary persons, under PP influence. 2) There were differences in dynamic developments between the PP treated group and the untreated group, for anxiety and salivary cortisol. 3) The influence of the PP used was significantly more intense on anxiety than on salivary cortisol, immediately pre- and poststress. 4) The PP used may be an effective, safe and accessible modulation path for stress caused by intense short duration physical exercise in sedentary persons.

**Keywords:** stress, short duration physical exercise, anxiety, salivary cortisol, phytotherapy.



# **The oxidant/antioxidant balance in animals exposed to chronic anakinetic stress**

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## **Abstract**

*Background.* Studies regarding the serum biochemical changes in redox homeostasis determined by chronic immobilization led us to investigate the serum and muscular effects of physical remobilization by exercise on the oxidant/antioxidant balance.

*Aims.* We investigated whether physical exercise preceded by complex stress through repeated immobilization can influence the prooxidant effects of immobilization.

*Methods.* The research was performed in 3 groups of white male Wistar rats: group I – control group, sedentary animals; group II – animals exercise trained for 28 days; group III – animals exposed to anakinetic stress (immobilization) for 3 hours daily and exercise trained for 28 days. The indicators of the oxidant/antioxidant balance were determined in the serum and muscle tissue. The moments included in the study were T<sub>1</sub> and T<sub>28</sub>.

*Results.* The chronic combined intermittent stress program – physical exercise preceded by immobilization (group III) induced, compared to the exercise trained group (group II), a diminution of oxidative stress with a significant decrease in serum malondialdehyde and a significant diminution of antioxidant defense on account of muscle glutathione, with insignificant changes in the other studied indicators, which supports the use of glutathione in antioxidant defense.

*Conclusions.* Daily training for 28 days induces an increase of oxidative stress in the serum and muscles, a decrease of antioxidant defense in the serum and an increase of it in muscles. Daily training preceded by anakinetic stress for 28 days determines a decrease of oxidative stress in the serum and a decrease of antioxidant defense in muscles.

**Keywords:** oxidative stress, training, anakinetic stress, rats.

# Histopathological changes in myocardial and nerve tissue under the influence of hypobaric hypoxia, physical exercise and antioxidants

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## Abstract

**Background.** Antioxidant supplementation can influence histological changes in myocardial and nerve tissues, after altitude exposure and physical exercise, conditions under which oxidative stress occurs.

**Aims.** To study the histopathological changes induced in the myocardium and the encephalon by physical exercise and antioxidant supplementation after exposure to hypobaric hypoxia.

**Methods.** The research was performed using the Hi-Lo model, in 4 groups of white male Wistar rats, under laboratory conditions corresponding to the altitude of 364 m, O<sub>2</sub> = 20.93%: group I – sedentary controls, kept under normoxia conditions; group II – sedentary animals, kept under normoxia conditions and supplemented with an antioxidant complex daily, for 28 days; group III – animals exposed to hypobaric hypoxia corresponding to a 5500 m altitude for 28 days, followed by exercise under normoxia conditions; group IV – animals exposed to hypobaric hypoxia for 28 days, followed by the administration of an antioxidant complex and daily exercise. Groups II and III received a complex of antioxidants – Antioxidant Optimizer, produced by the Jarow company (2010 Jarow Formulas, Los Angeles), distributed by Secom, in a dose of 45 mg/kg body weight, by oral gavage, daily, before exercise. The histopathological study was performed on the myocardium and 3 encephalic areas: hippocampus (Ammon's horn), thalamus and cerebral cortex.

**Results.** Hypobaric hypoxia exposure followed by exercise has beneficial effects on the heart, with a reduction in the number of the foci of chronic progressive cardiomyopathy, and on the nervous system, with the reduction in the number of apoptotic necrotic neurons. The administration of an antioxidant complex does not influence the cardioprotective and neuroprotective effects of hypoxic preconditioning, followed by physical exercise.

**Conclusions.** The Hi-Lo model involving the association of severe chronic intermittent hypobaric hypoxia and aerobic physical exercise under normoxia conditions has favorable cardioprotective and neuroprotective effects.

**Keywords:** hypobarism, physical exercise, antioxidants.

# The effects of kinetic physical therapy in the rehabilitation of peripheral arterial disease

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## Abstract

**Background.** A growing number of studies show physical training benefits in atherosclerosis and peripheral artery disease (PAD). The increase of these benefits can be achieved by combining exercise with physical therapy, whose effectiveness in the recovery of PAD has also been demonstrated over time.

**Aims.** This study aims to investigate the effect of physical-kinetic therapy on the recovery of atherosclerosis and PAD patients with and without signs of intermittent claudication.

**Methods.** A total of 68 consecutive patients diagnosed with PAD by determining the ankle-brachial index were randomized into two groups, one active and one control, in a ratio of 1:1. Group A (active) benefited from treatment facilities (baths with carbonated mineral water at a temperature of 34°C with a progressively increased duration from 15 to 25 minutes, mofette with a progressively increased duration from 10 to 20 minutes) and physical therapy, consisting of interval walking, postural Burger gymnastics, Master scale, ergonomic bicycle, semiflexion of the knees. Intensity of exercise was limited by pain in those with claudication and in those without claudication it was quantified by using the self evaluation Borg scale or by evaluating the intensity of exercise by pulse meter, a device that allows monitoring of heart rate during exercise and thus the intensity of exercise performed. Group B (control) was treated with physical therapy, consisting of carbonated mineral water baths of 34°C, 15 to 25 minutes, and mofette 10-20 minutes. Treatment duration was 18 days in both groups.

**Results.** Of a total of 68 patients, 65 completed the study (33 in the active group and 32 in the control group). At the end of treatment, in both groups there was a significant improvement in the distance walked for 6 minutes ( $p \leq 0.05$ ) and no statistically significant increase in the ankle-arm index was found. In group A we found a significant increase in the short duration functional parameters (4-meter walking speed in a normal and quick rhythm and the standing up test), while in group B these parameters were not significantly increased. There was also a significant increase in the distance walked for 6 minutes and in the short duration functional parameters in group A compared to group B.

**Conclusions.** Carbon dioxide therapy significantly increased walking ability as measured by the 6 minute walking test. Physical training provided additional benefits in terms of ability to walk and also significantly improved strength and endurance in the legs, measured by short duration physical performance tests. Neither exercise, nor carbon dioxide therapy significantly increased the ankle-arm index value after 18 days of treatment.

**Keywords:** exercise, peripheral arterial disease, balneotherapy, ankle-brachial index.

# Medical, demographic and psychological predictors of functional status and postoperative pain in patients with hip arthroplasty

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## Abstract

*Background.* Coxarthrosis is a frequent and invalidating disease in old and young patients. In advanced stages, total hip arthroplasty is needed. Post-surgery outcomes are influenced by many independent factors.

*Aims.* The aim of the current study is to develop and verify a multi-component model to predict success/failure in terms of functionality and degree of postoperative pain intensity in patients undergoing hip arthroplasty.

*Methods.* The participants (n=55) were selected from patients hospitalized at the Rehabilitation Hospital in Cluj-Napoca. The mean age of patients was m=62.84 (sd=11.18). Assessment scales: i) Harris hip score is a measure of the quality of life after total hip arthroplasty; ii) Visual Analogue Scale for the assessment of perceived pain; iii) the patients' clinical records; iv) a scale to assess catastrophic thinking style; v) B-COPE inventory that measures the different coping behaviors used by patients.

*Results.* The predictors included in the physical functioning model explained 65% of the criterion variance. The variables that reached statistical significance were: the type of surgical approach, age, catastrophic thinking and physical activity. The results for the second predictive model, with postoperative pain intensity as a criterion variable, showed that predictors explained 34.6% of the criterion variance. In terms of postoperative pain intensity the most important predictor was catastrophic thinking.

*Conclusions.* The factors that the patient and surgeon should consider when it comes to decide on a hip arthroplasty are: the type of surgical approach, age, physical activity and catastrophic thinking style. These are the most important factors in influencing both postoperative physical functioning and pain.

**Keywords:** coxarthrosis, hip arthroplasty, postoperative pain, hip function, postoperative rehabilitation.

# Investigations on the organizational and functional milieu of Romanian university sports

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## **Abstract**

*Background.* According to HC 1201/30.11.2011, the organization of the general framework, functioning and successful development of school and university sports is in charge of the Federation of School and University Sports (FSUS), a specialized body of the central public administration (the above mentioned judicial document regulates the main attributions of FSUS). The argument of elaborating this paper is the necessity of reorganizing the subsystem of university sports at the level of all the defining structural and infrastructural elements, at central and county level, as well as within the higher education institutions of all profiles; reorganization should also touch the sports organizations or in charge with sports activities, the public-private relation, the interrelation with the other subsystems, institutions and sports structures.

*Aims.* a) the analysis of the actual level of Romanian university sports and; b) investigations upon the organizational and functional milieu; c) the identification of opportunities for the optimization of Romanian university sports specific elements at system/institutional level.

*Methods.* In order to achieve the operational research approach we used both the analysis of the documents regulating the organizational and functional framework of university sports and the questionnaire inquiry method.

*Results.* Our research resulted in obtaining information on specific issues of Romanian university sports: the place of university sports within the national system of physical education and sports; the diversity of organizational forms of university sports; tendencies and perspectives of organization and development of the existent sports structures; particular organizational and functional aspects related to performance university sports (subordination, management, financing, means of optimization and marketing level).

*Conclusions.* The investigations on the organizational and functional milieu of Romanian university sports allowed us diagnosis to identify the opportunities of optimizing the specific elements at system/institutional level.

**Keywords:** optimization, university sports, investigation, opportunities, organizational milieu.

# Effects of mountain tourism practice on aerobic exercise endurance

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## **Abstract**

*Background.* Mountain tourism is a business mainly oriented to recreational effects. However, it is possible that the consistent practice of mountain tourism might offer adaptive ways of improvement in some forms of motor qualities.

*Aims.* This research aims to highlight the extent to which adaptive ways could be applied by improving some forms of resistance (aerobic capacity), by completing 5 tourist routes over 7 days. The routes were located in the Apuseni Mountains and were graded according to their length, strength and complexity.

*Methods.* The experiment was conducted on the occasion of the practical application of tourism and sport orientation in Padiș, in the Apuseni Mountains, at a camp. The subjects of the research were 45 first year students at FEFS Oradea (21 girls and 24 boys), matched for age and motor capacity. For this research we used the field test method (Luc Legger test to determine maximal aerobic speed and estimate maximal oxygen consumption), the statistical-mathematical method and the graphic method.

*Results.* Aerobic exercise endurance, assessed by maximal aerobic speed (MAS) and estimated through  $VO_{2max}$ , improved in all subjects.

*Conclusions.* An improvement in aerobic capacity (aerobic endurance) can be seen as a result of mountain tourism practice – without this form of motor activity becoming a training means – which recommends hiking on trails not only for recreational purposes, but also as a way to maintain and improve motor ability and a general health level.

**Keywords:** mountain tourism, capacity, resistance, aerobic exercise.

# **The evaluation of organizational ambient into sports teams from Iași**

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## **Abstract**

*Background.* The approach of sports groups from systemic perspective gives the possibility to consider sports groups as complex, adaptive, dynamic social systems. Their dynamics are in a continuous process of influence and interdependence.

*Aims.* The study is aimed at socio-affective contextual dimensions of sports groups climate in order to describe the objective situations existing at the level of sports teams in the city of Iași who play in the top level championships.

*Methods.* Have been subjected to question a number of 158 athletes (55 females, 103 males) who play basketball, football, handball, rugby, and volleyball. Respondents filled out a Questionnaire CO IV adapted the Romanian population, which includes 40 items, grouped by eight factors (task, structure, relationships, motivation, support, leadership, change, performance).

*Results.* Homogeneity tool for whole scale, as well as independent eight factors, was assessed. The performance level is the main variable that affects the factors of climate, and the sociomotric space has different influences on them. The biologic gender variable does not affect to any factor of the group climate of the local community sports teams.

*Conclusions.* In achieving sport performance, athletes are influenced primarily by the performance level. The support, that is offered by the clubs at the first performance level (female volleyball, male football – first teams, female basketball and rugby, male rugby), through financial rewards, as well as opportunities for personal development, contributes greatly to the achievement of the objectives set. Relationships and communication developed by members of women's studied teams do not differ when compared to those of the male. In addition, these relationships are stronger at teams with small sociomotric space (volleyball, basketball, and handball) when compared to those large sociomotric spaces (football, female and male rugby).

**Keywords:** sports groups, systemic perspective, contextual dynamics, and group medium.

## **A study on the personality traits of female students representing the Academy of Economic Studies basketball team**

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### **Abstract**

*Background.* The knowledge of the individual and collective personality traits of the sportswomen representing the Academy of Economic Studies basketball team is a prerequisite in conducting an effective training process.

*Aims.* The research requires the knowledge of the individual personality of sportswomen in the short and long term, followed by a completion of a team personality model to effectively adjust the process of preparation.

*Methods.* The research was carried out on a sample of 12 sportswomen, aged between 20-23 years, constituting the representative team of the Academy of Economic Studies. The inventory of personality “Cattel-16 P.F.” was applied in two testing times T<sub>1</sub> and T<sub>2</sub> (10.2011-05.2012). The research was carried out over 28 weeks (one academic year).

*Results.* The interpretation of obtained data led to the establishment of the personality traits of each player, and then, by calculating the arithmetic average of the results obtained by the 12 players for each of the 16 personality factors, the personality model of the team was decided.

*Conclusions.* During the study, due to the knowledge of the sportswomen’s personality, the training process was addressed to achieve performance and at the end of the study the improvement of the personality model of the sportswomen was evidenced.

**Keywords:** basketball, personality, sports teams, academic representative.



# **A study on the efficiency of the attack using attention training in the game of volleyball**

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## **Abstract**

*Background.* It is known that at present in the volleyball game there is no perfect balance between the moments of attack and defense, the latter having a significant role in victory. The more frequent the sequence of the two, the more the game becomes attractive and spectacular. Attacking moments must be completed by a winning point; their failure can cause disruption in the team's mechanism, with further significant consequences, especially when they occur repeatedly.

*Aims.* We believe that by using specially designed methods, based on attention training, we could improve the percentage of successful attacking shots; by alternating forceful attacking moves with placed ones, a state of uncertainty will be created in the defending team's game and the possession of the ball will be altered.

*Methods.* The research study was conducted with two women's volleyball teams, similar in value, playing in the North series of the A2 Republican championship: the experimental group 1 (n=12), which followed an attention training program aimed at improving the efficiency of a placed attacking shot (CSU LPS Oradea), and the control group 2 (n=12), which followed a traditional training program (CNE CSS Baia Mare). To improve attention training we used a number of ten exercises that are part of a complex technical and tactical training. To quantify the results we used SPSS 17.0, mixed ANOVA, Student test for independent and paired samples, and, for assessing placed attacking shots, the so-called composite index.

*Results.* The data regarding the evolution of the placed attacking shot that was subject to this analysis show the improvement of the value of this method of attack as a trend for the experimental group (Lap 1=.069) and (Lap 2=.067), which means that our intervention favors improvements in placed attacking shots, as compared with the control group whose evolution was in the normal range for this game action, and followed the traditional training method.

*Conclusions.* If the index of significance of the difference of averages between the two evaluation moments for Lap 1 and Lap 2 are in the trending level just for the experimental group, a continuation of this study through a longer term approach of this attention method or through a restructuring of the exercise included in the intervention program should be considered.

**Keywords:** placed attacking shot, attention, precision, volleyball.

## CASE STUDIES

### The role of physical therapy in the preservation of motor skills in Becker's muscular dystrophy – a case study

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#### Abstract

*Background.* This paper approaches Becker's dystrophy: a muscle disease which determines gradual and slow loss of motor skills.

*Aims.* In this case study, motor skills were evaluated using the Motor Function Measure (MFM) test.

*Methods.* The physical therapy protocol applied comprises stretching, stamina, aerobic and skill exercises.

*Results.* The comparative analysis of the data indicates the maintenance of a high level of motor skills, the improvement of coordination and distal motor control.

*Conclusions.* The long term objectives set are reached, given the regressive characteristic of the disease.

**Keywords:** muscular dystrophy, dystrophin, motor control, motor skill, MFM test.

## REVIEWS

### **Oxidative stress, an essential pathogenic mechanism of osteoarthritis in the elderly**

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#### **Abstract**

Osteoarthritis is the most common disorder of the musculoskeletal system. Its incidence increases with age, although aging itself is not an etiologic agent. Many studies have demonstrated that both cartilage aging and osteoarthritis are characterized by an increase in oxidative stress in cartilage tissue. Thus, oxidative stress can be considered as a pathogenic mechanism by which aging induces degenerative cartilage lesions.

The increase in oxidative stress in the elderly is due to a reduction in antioxidant defense (glutathione, superoxide dismutase) and an increase in the production of reactive species of oxygen and nitrogen, particularly nitrogen oxide and superoxide.

Under the action of reactive species, the chondrocyte reduces its response to growth factors, matrix protein synthesis, and can release metal proteinases or proinflammatory cytokines. Oxidative stress can also cause DNA damage, the alteration of energy metabolism, and finally, chondrocyte apoptosis.

In conclusion, a decrease in the number and anabolic functions of chondrocytes occurs in the cartilage, along with a degradation of the matrix by its reduced synthesis and increased degradation. Proinflammatory cytokines capable of inducing the synthesis of reactive species and the progression of aging lead to the maintenance and development of osteoarthritis lesions.

**Keywords:** osteoarthritis, aging, oxidative stress.