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Unde este sportul universitar din România? Where is the Romanian University Sports?

Traian Bocu

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Format din nivelurile cunoscute al activităților de educație fizică școlară și universitară, al activităților fizice pentru toți și al sportului de performanță - domeniul generic denumit *al sportului* din România - se bazează pe o vastă legislație. Această legislație este menită să susțină din mai multe puncte de vedere practicantii activităților sportive pe toate palierele amintite, în vederea promovării sănătății și a sportului de performanță. Deoarece întreaga populație a țării parcurge palierul de învățământ general-obligatoriu reprezentând școala gimnazială, considerăm că în acest segment trebuie căutate cauzele nivelului slab de dezvoltare al sportului românesc.

Manifestarea cea mai evidentă a nivelului scăzut al performanțelor se observă tocmai în sportul de performanță. Pe palierul învățământului școlar, din rețeaua Ministerului Educației Naționale operează două organizații sportive de stat care se ocupă de inițierea și formarea sportivilor de performanță: *Cluburile sportive școlare și Liceele pentru pregătirea sportivă* (LPS). În paralel, pe palierul extrașcolar, funcționează asociațiile și cluburile sportive din rețeaua Ministerului Tineretului și Sportului (MTS), precum și celelalte unități sportive organizate autonom, pe baza dreptului de asociere. Producția anuală a unităților școlare de performanță, care se oprește la vârsta de 18 ani, este destul de ridicată, dar de calitate îndoielnică. La unele ramuri de sport existența acestor unități sportive se resimte, în sensul prezenței României în topurile europene la nivel de juniori, unde se obțin sporadic unele rezultate relativ bune la mai multe sporturi.

Odată cu trecerea de la juniorat la seniorat, se produce însă o ruptură. Reprezentarea sportului românesc pe plan european și mondial în intervalul de vârstă 18-25 ani, care corespunde palierului universitar, scade până aproape de zero, marea performanță după 18 ani continuând aproape exclusiv în cluburile din rețeaua paralelă, cea a cluburilor din rețeaua MTS. În afara Facultăților cu profil sportiv, unde se concentrează majoritatea sportivilor de performanță care reușesc să pătrundă din cluburile sportive școlare și liceele sportive, în celelalte facultăți/universități prezența acestora este mult redusă. Sau chiar dacă sportivii

pătrund în filiera universitară, aceștia se pierd din cauza lipsei de interes a conducerilor acestor universități. Din acest motiv considerăm că există unele defecțiuni pe palierul învățământului superior. Se constată că în universități lipsește mentalitatea conform căreia o prezență universitară la competițiile sportive ar ridica imaginea universității respective, conform dictonului: „particip-exist, nu particip-nu exist”. Se constată că nu există o preocupare constantă a universităților pentru atragerea sportivilor de performanță în echipele reprezentative. Politicile de acest gen, specifice marilor universități occidentale, dar și universităților mici, nu sunt preluate de universitățile românești. Lipsesc, de asemenea, în universitățile de alte profiluri decât cel sportiv, amenajarea spațiilor speciale de cazare pentru sportivii de performanță și acordarea unor avantaje gen punctaj preferențial la acordarea cazării. De asemenea, ar fi de folos activității sportive universitare renunțarea la mentalitatea anacronică a conducerilor unor universități sau a unor cadre didactice față de solicitarea de către sportivii de înaltă performanță a deschiderii atitudinii față de susținerea testelor curente și la alte date decât cele fixate, în funcție de programul competițional, aprobarea sesiunilor deschise sau refacerea unor absențe în cazul participării la competiții/cantonamente, deși toate acestea sunt prevăzute în Legea educației fizice și sportului. Totul se lovește de răspunsuri implacabile, ca spre exemplu: „nu cunoaștem această lege”, „noi facem aici carte, nu sport” etc. Pentru încurajarea sportului de performanță în universități este necesară deschiderea și eliberarea unor noi mentalități ale conducerilor acestora, în ideea atragerii unor sportivi de performanță-studenți în echipele reprezentative. A nu se uita că vârsta studenției este cuprinsă între 18-25 ani, vârstă optimă pentru obținerea performanțelor maxime. O seamă de campioni mondiali sau medaliați, participanți la Campionatele Mondiale de atletism desfășurate în acest an (2013), în perioada 10-18 august, sunt studenți sau absolvenți ai unor universități occidentale.

Alte verigi slabe ale sportului de performanță sunt cele legate de procesul de selecție inițială și punerea

excesivă a accentului în programul de antrenament pe pregătirea tactică, în detrimentul pregătirii tehnice și fizice. Aceasta este o veche și generală carență românească, care derivă din dorința de a învinge adversarul dintr-o poziție inferioară numeric sau fizic. În loc de a se pune accentul pe o intensă pregătire tehnică și fizică, fapt ce ar putea duce la rezultate mai sigure, dar într-un interval de timp mai lung, se încearcă câștigarea unei competiții sportive preponderent prin manevre tactice, adică se practică mereu tentativa de a câștiga o competiție prin păcălirea adversarului sau specularea unor condiții meteo speciale sau prinderea adversarului pe picior greșit, fapt ce conduce către rezultate întâmplătoare. Am amintit într-un editorial precedent despre importanța pregătirii tehnice în cadrul lecției de educație fizică și antrenamentului. Există o perioadă optimă pentru învățarea tehnicii unor ramuri sportive; aceasta coincide cu parcursul școlii gimnaziale. Dacă se depășește acest interval de vârstă (11-16 ani), fără însușirea corectă a tehnicii unor mișcări, ramuri de sport sau probe, se creează un handicap manifestat prin formarea unui stil defectuos de execuție. Menționăm că în acest interval de vârstă motivarea sportivilor nu trebuie orientată în nici un caz către obținerea unor titluri sau recorduri naționale, ci către frumusețea și plăcerea de a concura, precum și aprecierea progresului propriu.

De asemenea, un punct slab îl constituie și nerăbdarea federațiilor și antrenorilor în obținerea performanțelor și

titlurilor de campion, bazate pe opțiunea acestora pentru coborârea permanentă a vârstei de selecție și inițiere, pe parcursul palierului vârstei preșcolare, care și acesta are caracter obligatoriu, la majoritatea ramurilor de sport.

Se constată că pregătirea sportivilor până la 18 ani numai pe filierele Cluburilor școlare și a LPS-urilor, chiar și a altor cluburi de performanță din rețeaua MTS sau chiar în regim privat, în condițiile actuale de efectuare a selecției și apoi de instruire, nu este suficientă. Se impune aplicarea unor măsuri durabile care să consolideze baza sistemului și să scoată la iveală, până la 16 ani, toate talentele existente, în fiecare promoție: a) ridicarea nivelului științific al efectuării selecției inițiale și pregătirii ulterioare acesteia, prin aplicarea, de către unitățile specializate interesate, a unor metodologii studiate și verificate; b) lărgirea rezervorului la nivelul întregului sistem școlar gimnazial, prin crearea unor baze de date locale, informatizate; c) reformarea palierului școlar gimnazial prin introducerea treptată în sistem ca profesori de educație fizică a absolvenților foști performeri în unele ramuri sportive, care să se ocupe de pregătirea tehnică superioară a elevilor de gimnaziu.

Editorialul se bazează pe concluziile cercetărilor proprii efectuate în aria tematică aferentă selecției în sport și pe experiența dobândită în calitate de fost sportiv și cadru didactic în domeniul sportului școlar și universitar.

ORIGINAL STUDIES
ARTICOLE ORIGINALE

Dairy products and red meat intake and the risk of breast cancer – a case-control study in females from Transylvania
Studiu caz-martor privind aportul alimentar de produse lactate, carne roșie și riscul la cancer mamar la femeile din Transilvania

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Abstract

Background. Dairy products and red meat are diverse groups of foods (milk, cheese, yoghurt, ham, etc.) that have a relatively high saturated fat content, which may increase breast cancer risk.

Aims. The aim of the study was to estimate milk and dairy products and red meat consumption and to establish the relation to breast cancer risk.

Methods. To achieve the aim of the study we used an epidemiological case-control study on 223 breast cancer patients and 211 non-cancer controls. The average age was 53.02±9.40 years for breast cancer women and 55.3±10.01 years for controls. Dairy products and red meat consumption was estimated with a valid semiquantitative food frequency questionnaire. The data were expressed as average values and we used the statistical Anova test to compare the results. We calculated odds ratio by the stratification of the groups on different levels of dairy products and meat intake (quartiles). The results were considered statistically significant at p<0.05.

Results. High levels of dairy intake represented a risk for breast cancer (OR=1.79, p=0.013). High levels of meat consumption (over 142 g/day) were associated with breast cancer risk (OR=1.67, p=0.03).

Conclusions. The study highlights the importance of decreasing the consumption of dietary high-fat animal products in order to prevent breast cancer risk in Transylvanian females.

Key words: breast cancer, risk, dairy products, red meat, diet.

Rezumat

Premize. Laptele, carnea roșie și preparatele reprezintă alimente de o mare diversitate (lapte, brânzeturi, produse lactate acidofile, șuncă etc.), care conțin o cantitate mare de grăsimi saturate, un presupus factor de risc al cancerului mamar.

Obiective. Scopul studiului a fost de a estima consumul de lapte, produse lactate și carne roșie la pacientele cu cancer de sân și de a stabili relația acestora cu riscul cancerigen mamar.

Metode. S-a aplicat un studiu epidemiologic caz-martor unui lot de 223 paciente cu cancer mamar și unui lot martor de 211 femei. Vârsta medie a femeilor cu cancer mamar a fost de 53,02±9,40 ani și a femeilor martor de 55,3±10,01 ani. Aportul alimentar de produse lactate și carne a fost estimat cu ajutorul unui chestionar de frecvență alimentară validat. S-a folosit testul statistic Anova pentru compararea valorilor medii calculate. Stratificarea lotului pe diferite nivele ale consumului alimentar (quartile) a permis calcularea riscului relativ estimat (odds ratio) în funcție de nivelul expunerii. S-au considerat semnificative statistic rezultatele a căror valoare p<0,05.

Rezultate. Studiul a arătat că nivelele mari de ingestie a produselor lactate au reprezentat un factor de risc pentru pacientele cu cancer de sân (OR=1,79, p=0,013). Consumul crescut de carne roșie a fost asociat cu creșterea riscului cancerigen (OR=1,67, p=0,03).

Concluzii. Studiul de față evidențiază necesitatea reducerii aportului alimentelor de origine animală cu conținut crescut de grăsimi, în vederea scăderii riscului cancerigen la femeile din Transilvania.

Cuvinte cheie: cancer mamar, risc, produse lactate, carne roșie, alimentație.

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Introduction

Breast cancer is the most common cancer in women worldwide. It is also the main cause of death from cancer among women globally. It was estimated at 1.38 million new cases diagnosed worldwide in 2008. The incidence of breast cancer is higher in Western Europe and lower in Central and Eastern Africa, with variations in the incidence of approximately five times between different parts of the world. The frequency of breast cancer has been steadily increasing in the developed world and in Central and Eastern Europe and Asia, regions that were considered with a low incidence. This increase was associated with changes in the population's lifestyle, such as reproductive behavior, weight gain, alcohol consumption and use of oral contraceptives (1).

There are well-established determinants of breast cancer in women: age, relative body weight, weight changes over time, lactation, late age at first pregnancy, early menarche, late menopause, endogenous and exogenous estrogen hormone concentration, history of benign breast disease, alcohol consumption, family history of cancer, exposure to ionizing radiation (Dunnwald et al., 2007; Cleary & Grossman, 2009). The differences in breast cancer incidence between different countries and geographic regions and the different dietary habits between populations have led to the hypothesis of the importance of environmental factors, including diet in modifying breast cancer risk. Milk, meat, dairy and meat products are food groups that can potentially modify the risk of breast neoplasms primarily by a high saturated fat content (Genkinger, 2013; Moorman & Terry, 2004). Dietary factors associated with breast cancer risk may act early in the course of life, causing rapid growth and development, and early age of puberty, known risk factors of breast cancer as shown above.

The aim of the study was to estimate the intake of milk, meat, dairy and red meat products in breast cancer patients and to establish their relationship to the risk of cancer.

This study is part of a larger research on the relationship between breast cancer and associated dietary factors (Năsui, 2007).

Hypothesis

Literature studies suggest that increased intake of animal foods rich in saturated fat, such as milk and red meat, may contribute to increased breast cancer risk. This study aims to estimate the consumption of milk, dairy products, red meat and red meat products among Transylvanian women and to establish the relationship with breast cancer.

Material and methods

Research protocol

A case-control study was conducted.

a) Period and place of research

The study was conducted during 2003-2007 and included patients with a histopathological diagnosis of breast cancer, hospitalized in the "Ion Chiricuță" Oncological Institute, Cluj-Napoca.

b) Subjects and groups

The investigated population group consisted of 223 patients with breast cancer. The average age of women

with breast cancer was 53.02 ± 9.40 years. The control group consisted of 211 women selected from the same geographical area as women with cancer, without the studied pathology, with a mean age of 55.3 ± 10.01 years ($p > 0.05$).

c) Test applied

Estimation of milk, meat and dairy and meat product consumption was performed using a validated food frequency questionnaire, developed by the U.S. National Cancer Institute in collaboration with Temple University (2). The questionnaire was designed to estimate the epidemiological and behavioral factors of breast cancer. The questionnaire was adapted to Romanian dietary habits and pre-tested to verify its validity. The questionnaire was applied by interview. It evaluated both the frequency and amount of intake of milk (including condensed milk) and dairy products, such as acidophilus products like yoghurt, buttermilk and cheese. The amount of milk and products such as yoghurt was estimated using standardized measures (cup, glass). Cheese was assessed by reporting the portion size of individuals. In the same way we evaluated the intake of meat and red meat products (bacon, ham, sausages, salami, traditional pork products). The interviewed subjects estimated portion sizes of consumed red meat (pork, beef, lamb) or meat products.

d) Statistical processing

The results were expressed as arithmetic means. The comparison of the means was performed using the ANOVA test. The stratification of the studied groups on different levels of consumption represented by quartiles allowed the calculation of odds ratio, the probability of developing breast cancer by level of exposure. Statistical analysis was done using Microsoft Excel 2000 and EpiInfo version 3.3.2. We considered results with a p value < 0.05 as statistically significant.

Results

The study results showed that the average intake of milk and dairy products, although elevated in both groups, presented no statistically significant differences. It is noted that acidophilus milk intake was significantly higher in patients with cancer, but intake of cheese was similar for both groups (Fig. 1).

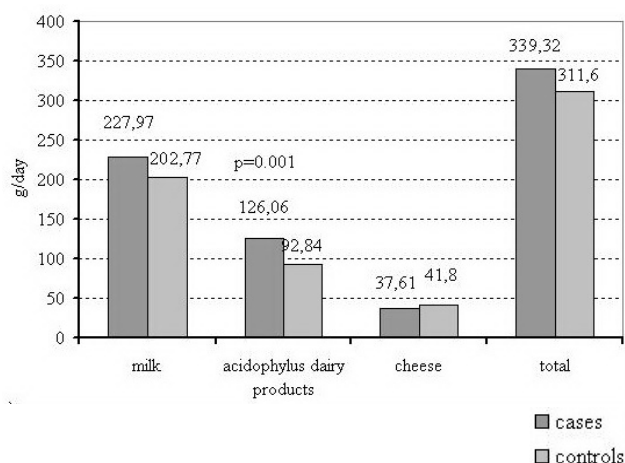


Fig. 1 – Average intake of milk and dairy products.

To estimate the likelihood of development of breast cancer according to consumption levels, a stratification of the studied groups on quartiles of food intake was performed. Estimated relative risk analysis of food consumption quartiles showed that milk intake levels higher than 250 g/day were a risk factor for the studied cancer patients (Table I).

Table I
Odds ratio of quartiles of milk intake.

Milk g/day	OR	95% CI	p
0.14 – 71.42	1.96	1.09 – 3.56	0.05
71.42 – 142.857	1.27	0.79 – 2.05	0.350
142.857 – 250	0.13	0.07 – 0.26	< 0.001
250 – 4000	1.91	1.21 – 3.02	0.005

In the case of acidophilus dairy products the probability of development of breast cancer occurred at consumption levels higher than 142 g/day. Instead, reduced intake was a protective factor for women in the study group (Table II).

Table II
Odds ratio (OR) of quartiles of consumption of acidophilus milk (yoghurt).

Yoghurt ml/day	OR	95% CI	p
2.19 – 57.143	0.88	0.54 – 1.44	0.68
57.143 – 64.285	0.39	0.23 – 0.66	< 0.001
64.285 – 142.857	1.13	0.7 – 1.82	0.690
142.857 – 900	2.37	1.44 – 3.9	< 0.001

The calculation of the estimated relative risk for different dietary levels of cheese consumption in the studied patients did not show a relationship of association with breast cancer risk depending on the consumed amount (Table III).

Table III
Odds ratio and cheese intake.

Cheese g/day	OR	95% CI	p
0.33 – 14.285	1.66	0.99 – 2.7	0.053
14.285 – 28.571	0.74	0.45 – 1.21	0.250
28.0571 – 45.714	0.75	0.48 – 1.17	0.220
45.714 – 400	1.17	0.73 – 1.87	0.57

The probability of development of breast cancer was estimated in relation to different levels of food intake in group I (consumption of milk and dairy products). This analysis shows again that consumption levels higher than 357 g/day were a risk factor for breast cancer patients (OR = 1.79, p = 0.013), while a lower intake can be a protection factor from breast neoplasia in the investigated women (Table IV).

Table IV
Odds ratio (OR) and dairy product intake.

Milk and dairy products g/day	OR	95% CI	p
0.33 – 150	2.24	1.38 – 3.64	0.05
150 – 250	0.42	0.26 – 0.68	< 0.001
250 – 357.143	0.60	0.37 – 0.96	0.031
357.143 – 4300	1.79	1.12 – 2.85	0.013

This study also estimated the dietary intake of red

meat and red meat products. In the category of red meat and processed meat were included pork, beef, lamb, veal. Meat and processed meat from wild animals or birds were excluded from this designation.

Thus, we calculated the average dietary intake of red meat and red meat products in the interviewed women and obtained similar values of ingestion without statistical significant differences in the studied groups (Fig. 2).

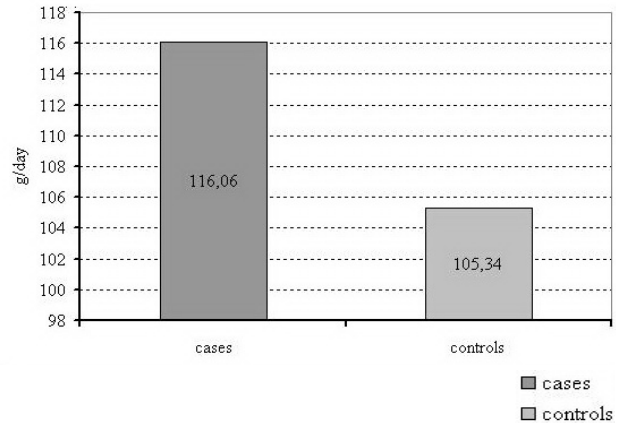


Fig. 2 – Average ingestion of red meat in the studied groups.

In contrast, the analysis of quartiles of red meat intake showed that levels higher than 142.86 g/day red meat were a possible risk factor for breast cancer in the studied patients (Table V).

Table V
Odds ratio (OR) and red meat intake.

Total red meat g/day	OR	95% CI	p
1 – 42.86	1.12	0.7 – 1.78	0.710
42.86 – 65.80	0.60	0.37 – 0.95	0.05
65.80 – 85.04	0.91	0.57 – 1.44	0.760
142.86 – 730.73	1.67	1.04 – 2.68	0.032

Discussion

Studies have shown that milk and dairy products may influence breast cancer risk by both an increasing and protective effect (Moorman & Terry, 2004). There are several hypotheses according to which milk and dairy products may increase the risk of breast cancer: a first hypothesis is that dairy products are sources of saturated fat which are related to breast cancer risk. On the other hand, milk may become contaminated with pesticides that are potentially carcinogenic and it may also contain growth factors, such as insulin-like growth factor (IGF-1), which promote the growth of cancer cells. Other studies argue for the protective effect of dairy products due to calcium, vitamin D and conjugated linoleic acid content. The active form of vitamin D (1.25 (OH) D) exerts antiproliferative effects in multiple cellular processes related to cell growth and development (Crew, 2002). Calcium and vitamin D act by interfering with cell proliferation and differentiation (Parodi, 2005). Studies carried out on animals receiving a high fat diet show that vitamin D and calcium supplementation reduces tumor growth (Shin et al., 2002).

Conjugated linoleic acid that is found in dairy products and meat from ruminant mammals inhibits tumor growth by oxidative effects in cancer cells (McCullough et al., 2005). The present study revealed that low milk intake exerted a protective effect in patients with cancer.

People who have a high consumption of milk and dairy products are likely to consume large amounts of meat and other products with a high fat content, which can also contribute to an increased risk of breast cancer. The study group also had an increased consumption of milk and cheese in relation to the age of the investigated subjects. The recommendations of the Romanian Ministry of Health are approximately 210 ml/day milk (and acidophilus dairy products) and 25 g/day cheese for the 40-60 year age group (Ionuț et al., 2004). As the study results show, these recommendations were mainly exceeded on account of milk and acidophilus dairy products (yoghurt). Milk is the main product that is consumed by Romanian females. Hence the need to reduce milk consumption and to choose food with a low fat content.

Regarding the consumption of red meat, international WCRF recommendations limit its intake to 80 g/day (***, 2007). The investigated women had a daily red meat intake above this value. In addition to the increased saturated fat content of red meat, this may be the source of carcinogenic chemicals resulting from high-temperature preparation or it may contain hormones (Taylor et al., 2007; Mignone et al., 2009).

Patients who consume large amounts of milk, meat and dairy and meat products may have an increased intake of other high calorie foods and a low intake of vegetables and fruit, lacking protection provided by these (Năsui et al., 2007b). It is therefore very difficult to separate the effects of the ingestion of milk and dairy products from other dietary nutrients. Excess calorie intake can lead to obesity, another risk factor for breast cancer in the studied patients (Năsui et al., 2007a). In addition, breast cancer is a multifactorial disease and there may be other factors that contribute to increased cancer risk (genetic, hormonal, alcohol consumption, physical inactivity, etc.), which were not included in the study.

Conclusions

This study highlights the necessity to reduce the consumption of animal origin products, namely milk, red meat, dairy and red meat products, to protect women from Transylvania from the development of breast cancer.

On the other hand, this study represents an argument for adopting a healthy lifestyle, which means having a proper diet, weight control and constant physical activity.

Conflicts of interest

There are no conflicts of interests.

Acknowledgement

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Influence of moderate physical exertion on subacute low back pain, after *Symphytum officinale* ointment treatment **Influența efortului fizic moderat asupra durerii lombare subacute, după tratamentul cu un unguent conținând *Symphytum officinale***

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Abstract

Background. Lumbar pain has a medical, psycho-emotional and social importance. At present, more accent is placed on pain phytotherapy. Of plants, *Symphytum officinale* (SO) is known for its anti-inflammatory and analgesic actions.

Aims. The objective of the study is to monitor the influence of moderate physical exertion on some sedentary subjects with subacute low back pain, after their treatment with a phytotherapeutic ointment containing SO (PSO), compared with non-treated control subjects.

Methods. The chosen subjects (n=30) were selected based on the requirements of the study. Exercise consisted of pedaling on the Stepper 130 rpm/0-999 W/RUN 7414-15-T, 8 days, 3 min/test/day, at a strength that was increased by 11 watts/day. The analyzed indicators were local pain sensation (P) and anxiety (A). The chosen phytotherapy preparation was PSO. Statistical evaluation was done based on the Student test.

Results. Following PSO administration, P decreased in the period prior to exercise, and P and A were significantly reduced during exercise, compared to the untreated group, at all testing times.

Conclusions. 1) At the end of PSO ointment therapy, both after the first and the second period of phytotherapeutic preparation use, the sensation of pain was significantly reduced in subjects with subacute lumbar pain. 2) The pain sensation and anxiety were significantly reduced in subjects treated with PSO ointment compared with untreated subjects, under moderate physical exertion conditions by pedaling on a stepper. 3) OSP ointment phytotherapy provided analgesic and emotional protection in the treated subjects, in moderate exercise by stepper pedaling. 4) Given the results obtained with the PSO ointment, as well as its therapeutic qualities of good tolerance by the body, absence of toxicity and economic accessibility, we propose its use by subjects with subacute low back pain, as a form of pain therapy and analgesic protection, during rest and under moderate exercise conditions.

Key words: lumbar pain, *Symphytum officinale*, pain, anxiety, VAS, STAI, moderate exercise, stepper.

Rezumat

Premize. Durerea lombară are importanță medicală, psiho-emotională și socială. În prezent, se pune tot mai mult accent pe fitoterapia durerii. Dintre plante, *Symphytum officinale* (SO) este cunoscut pentru acțiunile sale antiinflamatorii și antialgice.

Obiective. Obiectivul studiului este monitorizarea influenței efortului fizic moderat, asupra unor subiecți sedentari, cu dureri lombare subacute, după tratarea lor cu un unguent fitoterapeutic cu conținut de SO (PSO), comparativ cu subiecți martor netratați.

Metodă. Subiecții aleși (n=31) au fost selectați conform cerințelor studiului. Efortul fizic a constat în pedalarea pe Stepper 130 rpm/0-999 W/RUN 7414-15-T, 8 zile, 3 min/testare/zi, la o rezistență crescută cu 11 watt/zi. Indicatorii analizați au fost senzația de durere locală (P) și starea de anxietate (A). Preparatul fitoterapeutic ales a fost PSO. Evaluarea statistică s-a făcut pe baza testului Student.

Rezultate. În urma administrării PSO, P a scăzut în perioada anterioară efortului fizic, iar pe durata acestuia, P și A au fost semnificativ reduse față de lotul netratat, la toate momentele testării.

Concluzii. 1) La sfârșitul terapiei cu PSO, P, atât după prima cât și după a doua sesiune de utilizare a preparatului ales, a fost semnificativ redusă la subiecții cu durere lombară subacută. 2) P și A au fost semnificativ diminuate la subiecții tratați cu PSO, comparativ cu cei netratați, în condițiile efortului fizic moderat de pedalare pe un stepper. 3) Terapia cu PSO a asigurat subiecților tratați protecția antialgică și a stării emoționale, în condițiile efortului fizic moderat ales. 4) Date fiind rezultatele obținute cu PSO unguent, precum și calitățile terapeutice, de bună tolerare de către organism, absența toxicității și accesibilitate economică, propunem folosirea lui de către subiecți cu dureri lombare subacute, ca terapie și protecție antialgică, în condiții de repaus și de efort fizic moderat.

Cuvinte cheie: durere lombară, *Symphytum officinale*, senzația de durere, anxietate, VAS, STAI, efort fizic moderat, stepper.

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Introduction

Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage” (Loeser & Treede, 2008). Fear of injury has been posited as crucial in pain-related anxiety and in the development of chronic pain (Thibodeau et al., 2013). Of the types of pain, low-back pain is a common condition and a substantial economic burden in industrialized societies (Gagnier et al., 2006). Chronic low back pain (CLBP) is a common, yet challenging condition for both patients and clinicians (Esteves et al., 2013). Regarding the importance of synthesis medication in pain, Bogduk said in 2004 the following (Bogduk, 2004): “On the basis of the evidence, no drug regimen can be legitimately recommended for back pain.” Also in 2004, Reisner stated that “pain therapies from natural sources date back thousands of years to the use of plant and animal extracts for a variety of painful conditions and injuries” (Reisner, 2004). “Before extraction and synthetic chemistry were invented, musculoskeletal complaints were treated with preparations from medicinal plants, either administered orally or topically” (Cameron & Chrubasik, 2013). It is known that *Symphytum officinale* (SO) “has been used over many centuries as a medicinal plant. In particular, the use of the root has a longstanding tradition” (Staiger, 2012; Staiger, 2013).

The present article is a continuation of previous research of the authors regarding the relationship between sport and stress (Jurcău et al., 2011; Jurcău et al., 2012b) and the modulation of anxiety in physical stress with herbs (Jurcău, 2012; Jurcău et al., 2012a) or other methods (Jurcău & Jurcău, 2012).

Hypothesis

Pain is a topic of concern in medical research, and low back pain has been the object of numerous studies. Phytotherapeutic influence on pain, in general, and on low back pain, in particular, is a topic of permanent interest. Subacute low back pain has been less evaluated in terms of moderate exercise in subjects previously treated by phytotherapy.

Objectives

We intend to monitor the influence of moderate physical exertion, represented by pedaling on a stepper, on sedentary subjects with low back pain - after treating them with a phytotherapeutic ointment with a complex herbal content with synergistic action, including *Symphytum officinale* (PSO) - compared to sedentary subjects with the same kind of pain, but untreated, through the comparative evaluation of pain and anxiety.

Material and methods

We mention that - in conformity with the Helsinki Declaration, Amsterdam Treaty and Directive 86/609/EEC - we obtained the necessary license from the Ethics Commission of the College of Physicians, Cluj county, for our research on human subjects, and for the informed consent of the subjects included in the research.

The study and measurements were carried out during April-May 2013, in the Medical Family Office 122 in Cluj-Napoca.

a) Groups

The participation of all subjects in the study was voluntary. The subjects were tested on the Stepper 130 rpm/0-999 W/RUN 7414-15-T (3). We chose this type of equipment because its use leads to an important low back muscle exertion. The selected subjects were sedentary and diagnosed by the family doctor with subacute low back pain, due to prolonged sitting position at work, without other pathological correlations. Subjects with low back pain other than the selected one, mental disorders, antiinflammatory, antalgic or cortisone therapies and toxic addictions - alcohol, tobacco, drugs, coffee were excluded from the study.

Two groups were explored: the control group (C) that received no therapy and the experimental group (E), which was administered PSO. Both groups were subjected to the same type of physical exercise on the stepper.

b) Subjects

The number of subjects by groups was 12 women for E and 19 women for C. The mean age was 30.2±3 for E and 32.4±4 for C (Table I). The participants were asked not to consume alcohol, coffee, not to smoke and not to use any medication or antioxidant during the moderate physical exercise study.

Table I

The number and type of subjects by groups.		
Group	Experimental stress (E)	Control (C)
No. of subjects	12	19
Mean age	28.2 ± 3	31.4 ± 4
Gender	women	women

c) Study design

As a model of moderate physical exertion, exercise conducted on the Stepper 130 rpm/0-999 W/RUN 7414-15-T was chosen. The exercise testing method was the following: total duration of test = 8 days; duration/testing/day = 3 minutes/testing/day, in the morning between 8.00-10.00 hours; the type of exercise = stepping on the pedal, at a rate of 80 steps/minute; resistance in watts/testing/day increased by 11 watts/day compared to the previous day, from 21 watts on the first day to 98 watts on the last day.

The chosen phytotherapeutic preparation has a particular content of *Comfrey* = *Symphytum officinale* (PSO) and is called “Artrin” (1, 2). We chose it for its qualities: antiinflammatory and antalgic effects, good tolerance by the body, absence of toxicity and economic accessibility. PSO was administered to E before the beginning of exercise on the stepper, daily, over two periods of three weeks each, with a one-week break between the two periods, as follows: local application on the previously cleaned lumbosacral area, at 7.00, 12.00, 17.00 and 20.00 hours.

d) *The indicator determination program* was the same for C and E, being carried out as follows:

- The treatment period: time 1 = first time determination, basal (T1) - on the day prior to the start of the first period of PSO treatment, in the morning; time 2 = (T2) - on the day prior to the start of the second period of PSO treatment, in the morning.

- The physical exertion period: times 3-6 = (T3-T6) - on

each of the days 1, 3, 6, 8, immediately before exercise - for A, and immediately after exercise - for P.

e) *Explorations*

The examinations consisted of measuring pain and anxiety

- *Local pain assessment (P)*

It was performed by determining the pain score using the Visual Analogue Scale, which is a 10 cm horizontal line anchored at both ends, with the left end anchor (i.e. 1 cm) representing the minimum score (without pain) and the right end anchor (i.e. 10 cm) representing the maximum score (maximum pain). Each patient was asked to rate her pain by means of a vertical mark, which intersects the Visual Analogue Scale line at an appropriate point, under the rules of use of this scale (Scott & Huskisson, 1976; Reips, 2008).

- *Psychological anxiety assessment (A)*

The self-assessment questionnaire, STAI X1, X2 (State-Trait Anxiety Inventory) was used for anxiety (A) (Spielberger, 1983). STAI scores range from a minimum score of 20 to a maximum score of 80 on both A - State and A - Trait scales. Subjects respond to each item of STAI, by assessing themselves on a 4-point Likert scale (Jurcau et al., 2011; Jurcau et al., 2012a). The A - State scale is balanced with 10 directly quoted items and 10 (reverse scored) items; the reverse scored items of the A - State scale are: 1, 2, 5, 8, 10, 11, 15, 16, 19, 20. The A - Trait scale has 13 directly quoted items and 7 reverse scored items, in which case it is not possible to have a fully balanced scale; the reverse scored items of the A - Trait scale are: 1, 6, 7, 10, 13, 16, 19. The psychometric properties of STAI are good, with a Cronbach α (Cronbach, 1951, 2004) of 0.84, higher than the conventional cut-off value of 0.70.

f) *Statistical evaluation*

- The results obtained were analyzed using the SPSS 13.0. statistical package.

- For continuous data examination, Student's t test was used.

- The differences were considered significant at a $p < 0.05$.

Results

Note that the *reference values* were those of C and the *reference time* was considered to be T₁.

a) *Pain* (Fig.1). For C, P values were increased at T1; P values were insignificantly increased from T1 to T2 and T3 and significantly increased from T1 to T4 ($p < 0.03$), T5 ($p < 0.01$) and T6. For E, P values were increased at T1; compared to T1, P values were significantly lower at T2 ($p < 0.03$), T3 ($p < 0.005$) and T4 ($p < 0.05$), and they were insignificantly lower at T5 and T6. With the exception of T1, when P values were similar, at all assessment times, P values for C were higher than for E, with significant differences at T2 ($p < 0.05$), T3 ($p < 0.02$), T4 ($p < 0.01$), T5 ($p < 0.005$), and T6 ($p < 0.004$).

Table II

Impact of PSO therapy on pain.

Evaluation time	C - VAS		E - VAS	
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
T1	4.4	± 2.823	4.2	± 2.411
T2	4.3	± 2.418	3.1	± 1.903
T3	4.4	± 2.992	2.1	± 1.023
T4	5.1	± 3.192	2.6	± 1.331
T5	6.6	± 4.128	3.1	± 1.813
T6	8.4	± 6.002	3.9	± 2.024

b) *Anxiety* (Fig. 2). For C, A values were unchanged from T1 to T2 and were significantly increased from T1 to T3 ($p < 0.05$), T4 ($p < 0.04$), T5 ($p < 0.01$), and T6 ($p < 0.003$). For E, A values compared to T₁ were unchanged at T2 and T3, insignificantly increased from T1 to T4 and T5 and slightly significantly increased from T1 to T6 ($p < 0.05$). At all assessment times, A values for C were higher than for E, with significant differences at T3 ($p < 0.05$), T4 ($p < 0.01$), T5 ($p < 0.003$), and T6 ($p < 0.004$).

Table III

Impact of PSO therapy on anxiety.

Evaluation time	C - STAI		E - STAI	
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
T1	28.2	± 4.314	28.5	± 5.412
T2	30.1	± 8.022	26.4	± 4.404
T3	36.8	± 10.201	28.3	± 6.024
T4	45.4	± 12.415	32.3	± 9.391
T5	56.6	± 13.904	40.2	± 10.131
T6	69.6	± 19.412	48.1	± 12.306

c) *The evaluation of PSO modulation on the analyzed parameters at times T2 and T3 compared to T1* shows the impact of PSO therapy on the evaluated values of the parameters, in E compared to C, after the first PSO treatment period, and after the second PSO treatment period, compared with T1. Thus, the most important PSO influence is on pain sensation, in E, at T3 (0.5).

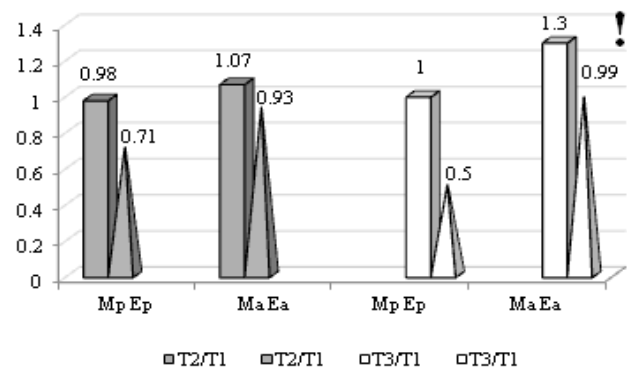


Fig. 3 - Impact of PSO therapy on P and A, at T2 and T3 compared to T₁.

Groups:

Cp = Control - P, Ca = Control - A

Ep = Experimental - P, Ea = Experimental - A

!" = starting time for moderate exercise

d) The evaluation of PSO modulation on the analyzed parameters at time T6 compared to T1 shows the impact of PSO therapy on the evaluated values of the parameters, in E compared to C, at the maximum intensity time of moderately applied exercise, compared to the immediately post-PSO therapy time. Thus, the most important PSO influence is on pain sensation (1.07) and on anxiety (1.5) in E.

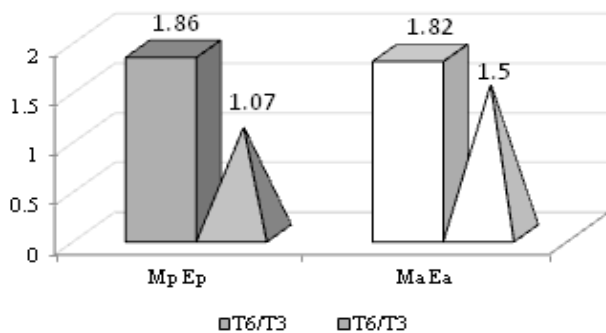


Fig. 4 - Impact of PSO therapy on P and A, at T6 compared to T3. Groups:

Cp = Control - P, Ca = Control - A
 Ep = Experimental - P, Ea = Experimental - A
 "!" = starting time for moderate exercise

Discussion

In 2004, Bogduk stated the following regarding the importance of synthesis medication in pain (Bogduk, 2004): "Drugs constitute a convenient option for low back pain and are commonly used. However, evidence for their efficacy is meagre. Many drugs used for back pain are no more, or only slightly more, effective than placebos. Others have side effects that outweigh their usefulness in relieving pain. On the basis of the evidence, no drug regimen can be legitimately recommended for back pain".

PSO and local pain sensation

Local PSO ointment application to E had the most significant results after the second PSO treatment period, which is evidenced by the significantly greater reduction in pain sensation from T1 to T3 ($p < 0.005$), compared to the decrease from T1 to T2 ($p < 0.03$).

By comparing the evolution of pain sensation for E and C throughout the study, it can be said that the chosen local PSO therapy provided protection against pain, which is demonstrated by the significant differences recorded with VAS for the non-physical exertion state (T2, $p < 0.05$; T3, $p < 0.02$), and especially for moderate physical exertion conditions (T4, $p < 0.01$; T5, $p < 0.005$ and T6, $p < 0.004$), with the most important differences at intense physical exercise moments, T5 and T6.

PSO and anxiety

Like in the other studies related to stress performed by us (Jurcău et al., 2011; Jurcău et al., 2012a; Jurcău & Jurcau, 2012), in this case too it was confirmed that changes in anxiety are anticipatory, values increasing for both C and E before physical exertion, which thus was proved to be perceived as a stress factor.

Although PSO does not have therapeutic indications

for anxiety modulation, we believe that in this E case, the reduction of anxiety might match with the decrease of fear regarding the possibility of pain appearance, along with the reduction of pain perception.

Pain and *Symphytum officinale* SO - Recent studies

The antiinflammatory, antalgic and anti-contracture effects of SO are supported by a number of Pubmed publications, of which we mention some related to this topic.

SO has proved to be effective in various types of pain. Thus, its effectiveness in osteoarthritis, sprains, muscle pain is demonstrated by the following results: a) "active topical comfrey formulations were effective in relieving pain and stiffness and in improving physical functioning and were superior to placebo in those with primary osteoarthritis of the knee without serious adverse effects" (Smith & Jacobson, 2011); b) "the use of topical comfrey product in patients with acute ankle distortion decreased the scores for pain on active motion, pain at rest and functional impairment, amelioration of swellings and overall tolerability was excellent" (Kucera et al., 2004); c) "the data showed superiority of the comfrey extract based ointment over the diclofenac gel in the treatment of distortions of unilateral ankle sprains" (D'Anchise et al., 2007); d) "study results confirm the known anti-inflammatory and analgesic effects of topical *Symphytum* cream in the treatment of patients with myalgia" (Kucera et al., 2005); e) "comfrey root is a valuable and rational therapeutic option for patients suffering from muscles and joint pain" (Wurglics & Ude, 2012).

Three recent studies show the importance of SO in low back pain: a) "there was a significant treatment difference between comfrey extract and placebo – VAS pain intensity decreased on average (median) approximately 95.2%; comfrey root extract showed a remarkably potent and clinically relevant effect in reducing acute back pain; for the first time a fast-acting effect of the ointment (1 h) was also witnessed" (Giannetti et al., 2010); b) "multiple randomized controlled trials have demonstrated the efficacy and safety of comfrey preparations for the topical treatment of pain, inflammation and swelling of muscles and joints in degenerative arthritis, acute myalgia in the back, sprains, contusions and strains after sports injuries and accidents, also in children aged 3 or 4 and over" (Staiger, 2012); c) "this randomised, multicentre, double-blind, three-arm, placebo-controlled trial compared a topical combination of 35% comfrey root extract plus 1.2% methyl nicotinate versus a single preparation of methyl nicotinate or placebo cream for relief of acute upper or low back pain; they applied a 12 cm layer of cream three times daily for 5 days; VAS on active standardised movement was markedly smaller in the combination treatment group than in the methyl nicotinate and in the placebo group" (Pabst et al., 2013).

Correlation between pain/ low back pain and anxiety - Recent studies

In 2012, Ellegaard and Pedersen claimed that "chronic low back pain (CLBP) is a stress factor in itself; when pain, stress and depression become overwhelming and there are few internal resources available, stress seems to become prominent." (Ellegaard & Pedersen, 2012).

Fear of injury directly predicts pain-related anxiety and indirectly predicts self-reported behavioral impairment; however, research has only measured fear of injury indirectly through other constructs (e.g., fear of illness and fear of movement) (Thibodeau et al., 2013). Regarding chronic low back pain (CLBP), in one of this year's studies Esteves mentions that: "Several studies have demonstrated a strong association between CLBP and psychological factors such as anxiety, fear-avoidance, self-efficacy, catastrophizing and depression. These factors are closely linked with emotional states; however, it is unknown whether CLBP patients process their emotions differently from asymptomatic individuals. The results suggest that dysfunctional emotional processing, particularly with regard to the suppression of emotions, is associated with CLBP" (Esteves et al., 2013). There is also recent evidence of this pain-emotional changes link, "in the present study we found compelling evidence for alterations of grey matter architecture in CLBP in brain regions playing a major role in pain modulation and control" (Ivo et al., 2013). Maybe this is why "psychological treatments have been successful in treating CLBP" (Domenech et al., 2013).

The peculiarities of this study compared to cited results

Similarities: a) the utility of SO as an anti-inflammatory ointment in osteoarticular and muscular pain (Kucera et al., 2005; D'Anchise et al., 2007; Smith & Jacobson, 2011; Wurglics & Ude, 2012), and in the case of low back pain (Giannetti et al., 2010; Staiger, 2012; Pabst et al., 2013); b) the antalgic action of SO ointment, both in terms of rest and exercise (Kucera et al., 2004); c) correlation between pain and anxiety (Esteves et al., 2013; Domenech et al., 2013; Thibodeau et al., 2013).

Differences compared to SO studies would include the following: a) our study demonstrates the reducing effect on pain sensation under moderate physical exertion conditions of pedaling on a stepper, for sedentary subjects with lumbar pain treated with PSO prior to exercise; b) highlighting the correlation between pain sensation and anxiety; c) finding the effect that the chosen pain therapy with PSO may indirectly have on reducing anxiety, which correlates with physical exertion.

Conclusions

1. At the end of PSO ointment therapy, both after the first and the second period of phytotherapeutic preparation use, the sensation of pain was significantly reduced in subjects with subacute lumbar pain.

2. The pain sensation and anxiety were significantly reduced in subjects treated with PSO ointment compared with untreated subjects under moderate physical exertion conditions of pedaling on a stepper.

3. PSO ointment phytotherapy provided antalgic and emotional protection in the treated subjects, under moderate exercise conditions by stepper pedaling.

4. Given the results obtained with PSO ointment, as well as its therapeutic qualities of good tolerance by the body, absence of toxicity and economic accessibility, we propose its use by subjects with subacute low back pain, as a form of pain therapy and antalgic protection under rest and moderate exercise conditions.

Conflicts of interest

Nothing to declare.

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The effect of amlodipine on motility and muscle tonicity Efectul amlodipinei asupra motilității și tonusului muscular

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Abstract

Background. Hypertension is the most common cardiovascular condition in adults. It is also very common in athletes. In addition to lifestyle changes, medications may be needed for the treatment of hypertension. Medication treatment can be complicated because of restrictions by athletic organizations and possible limitations on maximal exercise performance.

Aims. First-line therapy for athletes and physically active individuals may be different from that of the general population. Dihydropyridine calcium channel blockers (CCBs) are a reasonable choice. Despite their effects on heart rate, non-dihydropyridine CCBs do not appear to impair exercise performance. Treatments in active individuals are recommended in order to allow the best competitive sports results and reduce cardiovascular risk.

Methods. The experiments were conducted on white male Wistar rats. Substances were administered intraperitoneally. The groups were divided according to the substance used as follows: untreated control, amlodipine in 3 doses, reference substances (with a known action) in 1-2 doses, solvent. The tests used were: the open field test studying motility, curiosity, emotions in a new environment, and the recovery test exploring muscle tone on a rigid bar. For statistical analysis, we used the non-parametric chi-square test.

Results. Amlodipine increased motility to a mean value of 74.50 ± 5.48 at a dose of 1.25 mg/kg, but motility decreased with the increasing dose. Significant differences in motility occurred under the influence of amlodipine at a dose of 1.25 mg/kg ($p=0.002$, $t=4.05$), and 5 mg/kg ($p=0.004$, $t=-2.37$). There were also significant differences in motility between the doses of 1.25 and 2.5 mg/kg ($p=0.002$, $t=4.24$) and 5 mg/kg ($p=0.0003$, $t=5.39$).

Conclusions. Amlodipine significantly increased motility in a dose of 1.25 mg/kg ($p=0.002$) and significantly decreased it in a dose of 5 mg/kg ($p=0.04$). There were no significant changes in muscle tone.

Key words: amlodipine, motility, muscle tone.

Rezumat

Premize. Hipertensiunea este cea mai frecventă afecțiune cardiovasculară la adulți. De asemenea, este frecventă și la atleți. În afara schimbării stilului de viață, trebuie început tratamentul medicamentos al hipertensiunii. Tratamentul poate fi complicat datorită restricțiilor impuse de Federația de atletism și poate limita performanțele sportive.

Obiective. Terapia de primă linie la atleți și persoane fizic active trebuie diferențiată de cea a populației generale. Dihidropiridinele - blocante ale canalelor de calciu (CCB) sunt o alegere rezonabilă. În ciuda efectului asupra frecvenței cardiace, nondihidropiridinele CCB nu influențează performanța sportivă. Tratamentul recomandat trebuie să dea cele mai bune rezultate sportive și reducerea riscului cardiovascular.

Metode. Experimentele s-au efectuat pe șobolani masculi, rasa Wistar. Substanțele au fost administrate intraperitoneal. Loturile au fost împărțite în funcție de substanțele folosite în: grup netratat, amlodipine în 3 doze, substanțe de referință (cu acțiune cunoscută) în 1-2 doze, solventul. Testele folosite au fost: testul Openfield, care studiază motilitatea, curiozitatea și emotivitatea într-un mediu nou și testul de redresare, care explorează tonusul muscular pe o bară rigidă. Analiza statistică s-a efectuat cu testul nonparametric chi.

Rezultate. Amlodipina crește motilitatea la o medie de $74,50 \pm 5,48$ la doza de 1,25 mg/kg, dar motilitatea scade cu creșterea dozei. Diferența semnificativă s-a obținut sub influența amlodipinei pe motilitate la doza de 1,25 mg/kg ($p=0,002$, $t=4,05$), și la doza de 5 mg/kg ($p=0,004$, $t=-2,37$). Diferențe semnificative s-au obținut pe motilitate între dozele de 1,25 și 2,5 mg/kg ($p=0,002$, $t=4,24$) și 5 mg/kg ($p=0,0003$, $t=5,39$).

Concluzii. Amlodipina crește semnificativ motilitatea la doza de 1,25 mg/kg ($p=0,002$) și scade semnificativ la doza de 5 mg/kg ($p=0,04$). Asupra tonusului muscular nu s-au înregistrat modificări semnificative.

Cuvinte cheie: amlodipina, motilitate, tonus muscular.

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Introduction

Hypertension is the most frequent cardiovascular disorder in adults. Physically active individuals and professional athletes are also affected by hypertension. This is extremely common among athletes, decreasing life expectancy and generating substantial costs for the health care system. Although the proportion of affected individuals is significantly lower compared to the rest of the population, these should be constantly evaluated and monitored for blood pressure, in order to ensure competitive and safe sports participation (Asplund, 2010).

Regarding treatment, the implementation of changes in the lifestyle will be the routine in athletes and active individuals, having the same importance as for the rest of the population.

When lifestyle does not change, drug treatment should be administered for hypertension. When choosing the antihypertensive preparation, producers should select a preparation with favorable effects on blood pressure, as well as minimal hemodynamic changes during exercise. Drug treatment may be complicated because of restrictions imposed by sports organizations, and it can also diminish maximal sports performance. When pharmacological therapy is indicated in physically active persons, this will be ideal when: a) blood pressure is low at rest and during exercise; b) total peripheral resistance decreases, and c) it has no adverse effects on exercise capacity.

For these reasons, angiotensin converting enzyme inhibitors (ACEIs) and angiotensin II receptor blockers (in case of intolerance to angiotensin inhibitors) and calcium channel blockers are the drugs of choice in the case of mild exercise and in athletes with primary hypertension (Pescatello et al., 2004; Oliveira & Lawless, 2010).

In addition, antihypertensive drugs will be chosen taking into consideration the water and salt losses that usually occur in athletes, as well as the maintenance of sports performance and endothelial function. The effects of diuretics are less desirable and non-selective beta-blockers will be the last choice in hypertensive patients that are physically active (Asplund, 2010; Fagard, 2011).

First-line therapy in athletes may be different from that in the general population. Dihydropyridines are another reasonable choice. In spite of their effects on heart rate, dihydropyridines do not seem to affect sports performance (Fagard, 2011).

Calcium channel blockers inhibit slow calcium channels, reducing in this way calcium concentration in vascular smooth muscle cells, which results in a decrease of vascular and systemic resistance and general vasodilation. The effects of calcium channel blockers depend on the depolarization time, dose and chemical composition of the drug (Godfrain, 1989).

Dihydropyridines are L-type calcium channel blockers (Godfrain, 1987). Compared to them, phenylalkylamines (e.g. verapamil) have a more important action on the heart. Dihydropyridines are relatively vascular selective through their action mechanism in decreasing blood pressure. Medication with the dihydropyridine class that selectively acts on L-type channels occurs through the allosteric alteration of the channel gate. Due to

the lipophilic properties of dihydropyridines, type L calcium channel blockers cross the blood-brain barrier (e.g. felodipine, isradipine, nicardipine, nifedipine, nimodipine, nitrendipine, lacidipine, lercandipine), while a dihydropyridine apparently does not cross the blood-brain barrier (amlodipine) (Ritz et al., 2010).

This process may influence the oxygen and nutrient supplementation of the skeletal muscles and it also plays a role in removing catabolites.

Objectives

To evaluate the effect of amlodipine, a dihydropyridine compound, on the motility and muscle tone of rats, in order to evidence the presence of significant adverse effects on physical performance.

Hypothesis

Amlodipine treatment will improve exercise, compared to the control group.

Material and methods

Research protocol

a) Period and place of the research

All the animals used in this study were kept under accredited conditions and the described experiments were carried out according to the 1986 Directive of the European Committee (86/609/EEC) and Ordinance no. 37 of the Romanian Government of 2 February 2002.

b) Subjects and groups

The experiments were performed on white male Wistar rats with a weight of 125 ± 25 g. The animals were fed with standard laboratory food and received water ad libitum (Beiderbeck et al., 2012). The study groups were as follows: three groups treated intraperitoneally with different amlodipine doses (Pfizer Mack GmbH) (1.25, 2.5, 5 mg/kg body weight) diluted in 1 ml propylene glycol; an untreated negative control group; a control group treated intraperitoneally with 1 ml propylene glycol (Farmec S.A.) used as a solvent for amlodipine; two groups treated intraperitoneally with haloperidol (Schering-Pfough) (0.25, 0.5 mg/kg body weight). The doses were calculated at 1/10 of LD 50. The doses were chosen based on the acute toxicity of these preparations administered to rats by intraperitoneal route (Danilă et al., 1984). The reference substances were chosen depending on the test.

c) Tests applied

The open field test studies the motility, curiosity and emotions of animals in a new environment. The open field test was applied for three minutes to each animal separately. The mean of the crossings from one sector to another and the rears represent the spontaneous motility score (Rainer, 2003; Neumann, 2011).

The traction test explores muscle contraction in the animals using the Rotarod test and the evasion test on an inclined plane.

The recovery test evaluates muscle tone on a rigid bar (Matsumoto et al., 2002).

d) Statistical processing

All arithmetic means, standard deviations, standard errors and statistical significances were calculated

according to the Student test. Statistical processing was performed for the multivariate analysis of the variance with the Student t test. The probability value chosen was a p threshold of 0.05, with a significant value. The data were analyzed using SPSS version 11 for Windows.

For the recovery test, the non-parametric chi square test was used.

Results

The main tested substance was amlodipine.

Motility was tested in the open field in naïve animals. The results obtained were introduced in tables and figures.

Amlodipine increased *motility* compared to propylene glycol to a mean score of 74.50±5.48 in a dose of 1.25 mg/kg; motility decreased with the increase of the dose. Thus, at a dose of 2.5 mg/kg, a mean score of 32.67±8.19 was found, and at 5 mg/kg, the mean score was 25.67±7.20. Propylene glycol had a mean score of 45.83±4.50, and diazepam approximately the same mean of 50.70±6.30 (Table I, Fig. 1).

Table I

Motility score under the influence of amlodipine.

Indicator	Control	Propylene glycol	Amlodip 1.25 mg	Amlodip 2.5 mg	Amlodip 5 mg	Diazepam
Mean	55.1	45.833	74.5	32.667	25.667	50.7
Std. dev.	20.442	120.967	13.428	20.057	311.467	19.945
Std. error	6.46	10.998	5.482	8.188	17.648	6.307

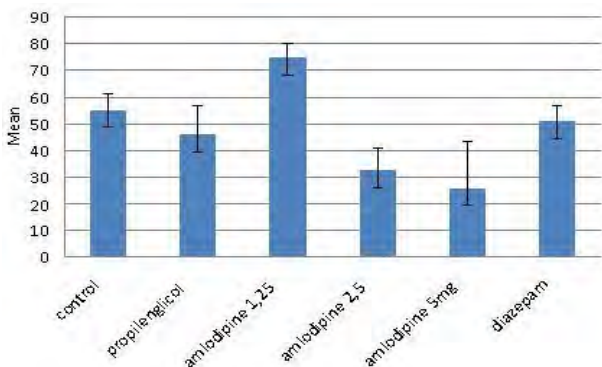


Fig. 1 – Motility score under the influence of amlodipine.

The statistical processing of data shows that motility was not significantly influenced by propylene glycol, the solvent of amlodipine.

Table II

”p” variation of motility under the influence of amlodipine.

Substances	Mean difference	t	p
Amlo - 1.25, Amlo - 2.5	41.833	4.245	.0017
Amlo - 1.25, Amlo - 5	48.833	5.394	.0003
Amlo - 1.25, Lact -	41.167	5.224	.0004
Amlo - 1.25, Pg+Sf -	28.667	4.046	.0023
Amlo - 2.5, Amlo - 5	7.000	.642	.5354
Amlo - 2.5, Lact -	-.667	-.067	.9479
Amlo - 2.5, Pg+Sf -	-13.167	-1.410	.1889
Amlo - 5, Lact -	-7.667	-.837	.4223
Amlo - 5, Pg+Sf -	-20.167	-2.375	.0389
Lact - , Pg+Sf -	-12.500	-1.730	.1143

There were significant differences in motility under the influence of amlodipine compared to propylene glycol at a dose of 1.25 mg/kg (p=0.002; t=4.05), and at a dose of 5 mg/kg (p=0.004; t=-2.37). Also, there were significant differences between the doses of 1.25 and 2.5 mg/kg (p=0.002; t=4.24) and 5 mg/kg (p=0.0003; t=5.39). A comparison of the effects of the other doses on motility shows no significant differences (Table II, Fig. 2).

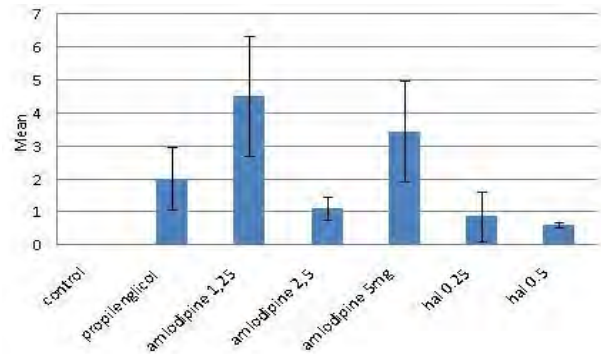


Fig. 2 – Muscle tone score under the influence of amlodipine.

The influence of propylene glycol on the rears was expressed by a mean score of 6.00±1.033, which increased under the action of amlodipine in a dose of 1.25 mg/kg to 12.67±1.085, and then decreased to 4.167±1.075 at a dose of 2.5 mg/kg and to 2.333±0.76 at a dose of 5 mg/kg (Table III).

Table III

Rearing score under the influence of amlodipine.

Indicator	Propylene glycol	Amlodip 1.25 mg	Amlodip 2.5 mg	Amlodip 5 mg
Mean	6	12.67	4.167	2.333
Std. dev.	2.53	2.66	2.64	1.86
Std. error	1.033	1.085	1.075	0.76

There were significant differences in rears between the control group (propylene glycol) and the group with amlodipine in a dose of 1.25 mg/kg (p=0.001; t=4.45), and the group with a dose of 5 mg/kg (p=0.01; t= -2.86). There were also significant differences between the groups with different amlodipine doses; thus, between the dose of 1.25 mg/kg and the dose of 2.5 mg/kg p=0.0002; t=5.56, and between the amlodipine dose of 1.25 mg/kg and 5 mg/kg the probability was p<0.0001; t=7.80. There were no statistically significant differences between the other groups (Table IV).

Table IV

”p” variation under the influence of amlodipine on rears.

Substances	Mean difference	t	p
Amlo - 1.25, Amlo - 2.5	8.500	5.558	.0002
Amlo - 1.25, Amlo - 5	10.333	7.799	<.0001
Amlo - 1.25, Lact -	5.667	1.545	.1533
Amlo - 1.25, Pg+Sf -	6.667	4.450	.0012
Amlo - 2.5, Amlo - 5	1.833	1.390	.1946
Amlo - 2.5, Lact -	-2.833	-.773	.4573
Amlo - 2.5, Pg+Sf -	-1.833	-1.228	.2475
Amlo - 5, Lact -	-4.667	-11.302	.2221
Amlo - 5, Pg+Sf -	-3.667	-2.859	.0170
Lact - , Pg+Sf -	1.000	.274	.7898

The mean time of recovery on the rigid bar was 2 ± 0.95 seconds for propylene glycol, and under the influence of amlodipine at a dose of 1.25 mg/kg it increased to 4.5 ± 1.80 seconds, decreased at the dose of 2.5 mg/kg to 1.08 ± 0.33 , but increased at the dose of 5 mg/kg to 3.42. Under the action of haloperidol, the recovery time decreased to a mean time of 0.83 ± 0.75 for the dose of 0.25 mg/kg and to 0.58 ± 0.08 for the dose of 0.5 mg/kg (Table V).

Table V
Statistical values of recovery on the rigid bar under the influence of amlodipine.

Group	Mean	Standard deviation	Standard error
Propylene glycol	2	2.32	0.95
Amlodipine 1.25 mg	4.5	4.40	1.80
Amlodipine 2.5 mg	1.08	0.80	0.33
Amlodipine 5 mg	3.42	3.79	1.55
Haloperidol 0.25 mg	0.83	0.31	0.75
Haloperidol 0.5 mg	0.58	0.20	0.08

There were significant differences only between the reference group compared to the untreated control group ($p=0.003$; $t=2.23$). There were no significant differences in the case of the other comparisons by groups.

The proportion of the animals that remained on the bar for 3 minutes was 50% for the untreated group and 0% for propylene glycol 0.5 mg/kg and amlodipine 2.5 mg/kg. The percentage increased to 16.67% for the groups with amlodipine in the doses of 1.25 and 5 mg/kg, reaching 66.67% for haloperidol 0.5 mg/kg (Table VI).

Table VI
Percentage of animals remaining on the rigid bar.

3' (180")	Control	Hal 0.25	Hal 0.5	Pg	Aml-1.25	Aml-2.5	Aml-5
%	50.000	16.667	66.667	0.000	16.670	0.000	16.670

Discussion

Calcium channel blockers inhibit the conductance of slow calcium channels, resulting in the reduction of calcium concentration in the vascular smooth muscle cells, which leads to a decrease in systemic vascular resistance with generalized vasodilation (Bellien, 2013). Calcium channel blockers are effective in reversing ventricular hypertrophy.

Dihydropyridines such as amlodipine (Norvasc) and nifedipine (Procardia) may induce reflex tachycardia, fluid retention, and vascular headaches. Non-dihydropyridines such as verapamil (Calan) and diltiazem (Cardizem) may cause the suppression of heart rate, minor discomfort in the case of a high heart rate, decreased left ventricular contractility and constipation (Dorffel, 2004). Calcium channel blockers have no major effects on energy metabolism during exercise, and the maximal oxygen uptake is generally maintained. There is a potential for the competitive mechanism of blood flow steal at muscular level (caused by vasodilation) and the early onset of the lactate threshold. The way in which contracture induced by aggression leads to the increase of calcium remains unknown. However, calcium channel blockers, particularly

dihydropyridines, are generally well tolerated and effective in physically active patients. They are frequently used as first-line agents in black athletes (Niedfeldt, 2002).

The endocannabinoid inhibitors at cellular level are capable of exerting a strong action at each of the four tests of the rats on behavioral activities (analgesia on a "hot hob", immobility in a "ring", rectal hypothermia and hypolocomotion in the open field (Ligresti et al., 2006).

Baker (2001) discovered that endocannabinoid inhibitors in the cells have the capacity to inhibit limb spasticity in the rats, with CREAE, a multiple sclerosis (MS) model. This observation was confirmed by the contribution of six other types of inhibitors such as AM404 and arvanil that may also act through TRPV1 receptors (Baker, 2001; Brooks, 2002, Ligresti et al., 2006).

Also, it is known that contractures may cause skeletal muscle lesions that result from ruptures of the protein structure of normal muscles. The contracture that induces muscle lesions is characterized by a series of metabolic events including inflammatory cell infiltration, increase of intracellular calcium concentration, release of muscular enzymes, muscle inflammation, and a marked decrease of voluntary and involuntary strength. The subsequent increase of intracellular calcium concentration as a result of the initial contraction contributes to the progress of the muscle lesion through the stimulation of calcium-activated neutral proteases (CANP) such as calpain (increased calcium affinity and many forms of low calcium affinity). These proteases can initiate proteolysis by cleaving the proteins associated with the "sensitive" Z line such as desmin and actin. The exposure of muscles to other treatments such as calcium ionophores, as well as the increase of intramuscular calcium evidence the same types of morphological and ultrastructural changes as those seen in excentric muscle lesions in the muscle cell. However, one or a combination of the following are plausible reasons: loss of the integrity of the sarcoplasmic reticular membrane; rupture of the sarcolemmal membrane; opening of channels sensitive to stimuli; or the alteration of the triad and the orientation of the t tubes resulting from the entry of calcium through voltage-sensitive channels such as dihydropyridine receptors. Calcium channel blockers and other calcium chelators reduce or prevent contraction, inducing the increase of intracellular calcium levels and subsequent changes following muscle lesions in rodents. The ability of CCB to prevent contraction, induce increases in cytosolic and mitochondrial calcium concentrations and subsequent histological changes indicates that the disturbance of the normal activity of calcium channel blockers is at least partially responsible for allowing calcium to enter the muscle cell (Beaton, 2002).

Conclusions

1. Amlodipine significantly increases motility at a dose of 1.25 mg/kg ($p=0.002$) and significantly decreases it at a dose of 5 mg/kg ($p=0.04$).
2. Similarly to its effect on motility, amlodipine at a dose of 1.25 mg/kg increases the number of rears and significantly decreases it at the dose of 5 mg/kg ($p=0.01$).
3. There are no significant changes in muscle tone.

Conflicts of interest

There are no conflicts of interests.

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Physical exercise impact on the risk of hypoglycemia in insulin-dependent patients

Impactul exercițiului fizic asupra riscului de producere a hipoglicemiei în cazul pacienților insulino-dependenți

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Abstract

Background. Studies of recent decades in the field of diabetology reveal the importance of physical exercise in achieving an adequate metabolic control of insulin-dependent patients. An effective therapeutic approach involves ongoing and personalized assessment of patients, related to the intensity and duration of physical exercise, as well as an appropriate adjustment of insulin dosage and diet, pre- and post-exercise, in order to lower the frequency and severity of hypoglycemic episodes.

Aims. Studying the glycemic response to exercise of 14-15 year old diabetic patients, as well as optimizing long term metabolic control, by a six month longitudinal experiment.

Methods. Clustered sampling brought about two investigated groups: the experimental group (A-12 subjects), to which a program of 45 minute moderate intensity exercise was applied, 4 sessions per week, with the duration of 6 months, and the control group (B-12 subjects), in which physical activity was limited to ADL (Activities of Daily Living). Glycemic control was accomplished by the initial and final evaluation of glycosylated hemoglobin (HbA1c) values. The frequency of hypoglycemic episodes was reported monthly by the questionnaire method. Inferential statistics results were assigned using the GraphPad InStat 3 statistical software.

Results. The mean HbA1c values were significantly different between the two groups, being decreased in the experimental group compared to the control group, in the final evaluation. Also, the frequency of reported hypoglycemic episodes decreased from 58% in the first month of the experiment to 17% at its end.

Conclusions. Moderate intensity exercise, systematically applied, induces significant decreases in blood glucose levels. Consequently, adjustments related to insulin requirements and carbohydrate intake significantly reduce the frequency of hypoglycemic episodes, ensuring the long-term adequacy of metabolic control of diabetes.

Key words: metabolic control, hypoglycemia, glycosylated hemoglobin, physical exercise

Rezumat

Premize. Studiile efectuate în ultimele decenii în domeniul diabetologiei relevă importanța exercițiului fizic în obținerea unui control metabolic adecvat în cazul pacienților insulino-dependenți. O abordare terapeutică eficientă presupune evaluarea permanentă și individualizată a pacienților, privind intensitatea și durata efortului fizic efectuat, precum și ajustarea corespunzătoare a dozelor de insulină și a dietei pre- și postfort, în vederea reducerii frecvenței și intensității episoadelor hipoglicemice.

Obiective. Realizarea unui experiment de tip longitudinal cu o durată de șase luni, cu scopul studierii răspunsului glicemic imediat la efort în cazul unor pacienți diabetici cu vârsta de 14-15 ani, precum și optimizarea controlului metabolic pe termen lung al acestora.

Metode. Prin eșantionare dirijată au fost investigate două grupuri: grupul experimental (A-12 subiecți), asupra căruia a fost aplicat un program de exerciții fizice de intensitate moderată, cu durată de 45 minute, 4 ședințe săptămânal timp de 6 luni și grupul martor (B-12 subiecți), la care activitatea fizică s-a rezumat la ADL (Activities of Daily Living). Monitorizarea glicemică s-a realizat prin evaluarea inițială și finală a valorilor hemoglobinei glicozilate (HbA1c). Frecvența episoadelor hipoglicemice a fost raportată lunar, prin metoda chestionarului. Rezultatele statisticii inferențiale au fost obținute utilizând softul statistic GraphPad InStat 3.

Rezultate. Media valorilor HbA1c diferă semnificativ, fiind diminuată la grupul experimental față de grupul martor, în etapa evaluării finale. De asemenea, frecvența episoadelor hipoglicemice raportate a scăzut de la 58% în prima lună a experimentului la 17%, la finalul acestuia.

Concluzii. Exercițiul fizic de intensitate moderată, aplicat sistematic, induce scăderi semnificative ale nivelului glicemiei. Ajustările concomitente și corelate ale necesarului de insulină și carbohidrați reduc semnificativ frecvența episoadelor hipoglicemice, asigurând pe termen lung un control metabolic adecvat al diabetului zaharat.

Cuvinte cheie: control metabolic, hipoglicemie, hemoglobina glicozilată, efort fizic.

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Introduction

Insulin-dependent diabetes (T1D) is a chronic disease with onset in childhood or early adulthood, developing inflammatory destructive lesions of pancreatic beta cells, related to a decrease or loss of insulin secretion (Dumitrescu & Perciun, 2000). This condition requires compulsory insulin administration and essential lifestyle changes (continuous glycemic monitoring, proper diet, physical exercise) in order to meet an optimal metabolic control and maintain the quality of life.

The most relevant parameter for an accurate glycemic control is the concentration of glycosylated hemoglobin (HbA1c), which reflects the average blood glucose levels within the last 2-3 months, therefore, HbA1c is used for long-term glycemic control (Vereşiu et al., 2004; Ragnar & John, 2010). The correlation between HbA1c values and average daily blood glucose is shown in Table I. We note here that an adequate metabolic control requires HbA1c values below 7%, the range of reference values for healthy individuals being between 4-6%.

Table I
Correlation between HbA1c values and average daily blood glucose in T1D patients.

HbA1c values (%)	Average blood glucose (mg/dl)
7	150
8	180
9	210
10	245
11	280
12	310

(Vereşiu et al., 2004)

The immediate effects of achieving this therapeutic goal (HbA1c below 7%) inevitably involve the appearance of the most common side effect of insulin therapy, as well as the most feared complication of type 1 diabetes in children and young people - hypoglycemia.

Hypoglycemia involves the lowering of blood glucose levels below 55 mg/dl (Vereşiu et al., 2004), with a usual remission of its signs or symptoms by glucose administration.

In insulin-treated diabetes, hypoglycemia occurs due to the following conditions (De Vries et al., 2004):

- insulin excess
- inadequate carbohydrate ingestion
- late degradation of insulin in the body
- deficiency of counter-regulatory hormone response
- failure to recognize hypoglycemia symptoms.

Severe hypoglycemia requires assistance for correction, causes stress and anxiety (De Vries et al., 2004), significantly influencing glycemic self-monitoring, as well as patient adherence to insulin treatment (Brands et al., 2005). Conclusions of specialized studies in the field of insulin therapy show that severe and prolonged hypoglycemia could lead to irreversible damage of the nervous system (Wiltshire et al., 2006; Matyka et al., 1999).

Physical exercise is introduced as a therapeutic method in a T1D patient educational program. Practicing regular exercise in a well balanced metabolic condition increases endogenous or exogenous insulin sensitivity, improves

glucose tolerance and therefore leads to a decrease in blood glucose levels, as a short-term response, as well as in HbA1c values, as long-term control (Dumitrescu & Perciun, 2000). Despite these beneficial effects, increasing the risk of severe hypoglycemic episodes as a result of improper exercise induces panic in T1D patients and their families and may ultimately lead to the rejection of all forms of physical activity (McMahon et al., 2007; Kaufman et al., 2002). As such, the attention of specialists in the field of diabetology is now largely focused on identifying the most effective therapeutic modalities to reduce this major risk.

According to the *American Diabetes Association*, educational programs of children and young people diagnosed with type 1 diabetes, with a proper glycemic balance, should include at least 60 minutes of daily moderate aerobic exercise (Herbst et al., 2007).

Applying an exercise program to patients with type 1 diabetes must take into account that their insulinemia derived by exogenous administration has a different response to exercise compared with non-diabetic individuals (Guelfi et al., 2005). Inadequate insulin administration causes an imbalance of insulin metabolism, either by the liver production of glucose or through its peripheral use. The excess of exogenous insulin administration in an inflexible manner will lead to hypoglycemia by faulty glucose release from glycogen stores, as well as by excessive peripheral glucose expenditure (Vereşiu et al., 2004).

Conclusions of an impressive number of specialized studies in the field show that it is virtually impossible to determine a proper pattern, due to the insulin therapy features and the individual metabolic response to the *insulin-diet exercise* algorithm (Bota & Teodorescu, 2007).

An effective therapeutic approach involves an ongoing and individualized assessment of the intensity and duration of exercise performed, as well as an appropriate adjustment of diet and insulin dosage before and after exercise, in order to reduce the frequency and severity of hypoglycemic episodes (Chase et al., 2001). Thus, our research frames a complex therapeutic algorithm, developed within a team (diabetologist, nutritionist, coach) with permanent interaction, according to the fundamental principles of T1D therapy (Herbst et al., 2007), such as:

- performing physical exercise given that glucose does not exceed 250 mg/dl, without signs of ketosis;
- a blood glucose value below 100 mg/dl pre-exercise requires the intake of adequate amounts of both fast and slow absorbable carbohydrates;
- exercise is permitted under the knowledge of its type, intensity and duration;
- performing scheduled exercise that allows the adjustment of insulin doses and carbohydrate intake;
- avoidance of insulin administration in a region where the muscle mass is to be exercise trained;
- blood glucose monitoring before, during and after exercise;
- exercise to be delayed to the moment of insulin administration.

Hypothesis

Performing systematic and controlled moderate-intensity exercise reduces the frequency and severity of

hypoglycemic episodes under a flexible scheme of insulin treatment and permanent adjustment of carbohydrate intake, leading to a long-term metabolic control in patients with type 1 diabetes.

Material and methods

Research protocol

We mention that according to the Helsinki Declaration, Amsterdam Protocol and Directive 86/609/EEC, we obtained the subjects' informed consent for their personal participation in the research.

a) Period and place of the research

Our research was conducted as a longitudinal experiment type, with a duration of 6 months (November 2012-April 2013), aiming to study the immediate glycemic response to exercise, to assess and reduce the risk of post-exercise hypoglycemia, as well as to improve long-term metabolic control in patients diagnosed with type 1 diabetes from the *Association of Children and Youth with Diabetes* (ASCOTID Mures).

The research protocol used the following methods:

- the observation method (for a relevant case history research);
- the questionnaire method (to determine the inclusion and exclusion criteria, as well as for the periodic report of hypoglycemic episodes);
- testing of glycemic parameters (pre- and post-exercise blood glucose levels, HbA1c values);
- statistical and mathematical methods („t” Student test – for assignment and interpretation of statistical significance).

b) Subjects and groups

Two groups were investigated by conducted sampling: the experimental group (A-12: 5 girls, 7 boys, normal weight, with a length of 2-3 years of T1D), to which a 45 minute program of moderate intensity aerobic exercise was applied, 4 sessions per week, with a duration of 6 months, and the control group (B-12: 6 girls, 6 boys, normal weight, with a length of 1-3 years of T1D), in which physical activity was limited to ADL (activities of Daily Living), as well as unscheduled exercise, thus undirected, with various degrees of intensity.

The experiment inclusion criteria were as follows:

- patients diagnosed with type 1 diabetes within the 14-15 year age group;
- patients diagnosed for at least one year, with a good metabolic balance and without major side effects;
- patients with good adherence to multiple insulin administration (2 doses daily in the control group/4-5 doses daily in the experimental group);
- patients with good response to our experimental program.

c) Tests applied

Short-term glycemic monitoring was performed by testing pre- and post-exercise blood glucose levels, while long-term monitoring included the initial (November 2012) and final (April 2013) assessment of glycosylated hemoglobin (HbA1c) values. The frequency of hypoglycemic episodes was reported monthly by the questionnaire method.

d) Statistical processing

Inferential statistics results were assigned using the

statistical software GraphPad InStat 3.

The interpretation of results, by comparing the "p" value significance and the periodic analysis of the subjects' reports covered two key areas:

- statistical significance of the frequency and intensity of hypoglycemic episodes between the experimental group (A) and the control group (B), and the progress of the experimental group throughout the investigation, based on the response to the conducted exercise program;
- statistical significance of HbA1c values in both groups between the initial and final testing.

Results

a) Frequency and intensity of hypoglycemia

The results of the experiment showed a significant difference in the frequency of hypoglycemia between groups A and B, as well as within group A, throughout the duration of the exercise program. In group B, the average frequency of hypoglycemic episodes ranged between 38-45% throughout the experiment, with significant daily fluctuations. Group A showed a significant decrease in frequency from 58% in the first month of the experiment to 17% at its end. Regarding the intensity of hypoglycemia, group B reported a number of 7 severe episodes, while group A only recorded 3 such cases.

b) Blood glucose monitoring

In group B, the average of daily blood glucose levels showed major fluctuations, between 68-285 mg/dl, throughout the course of the experiment. Group A had an average of 176 mg/dl during the first month of the experiment, which lowered to 142 mg/dl at its end. Also, in group A, significant fluctuations could be seen in the first month of the experiment (80-206 mg/dl), then daily blood glucose levels stabilized during the program implementation (88-152 mg/dl).

c) Long term blood glucose control by HbA1c values

The initial and final HbA1c values of the control and experimental groups are shown in Tables II and III. In group B there were no statistically significant differences ($t=0.72$; $p>0.05$) in the mean HbA1c values between the initial (8.35%) and final (8.34%) testing. Group A showed a significant decrease ($t=3.74$; $p<0.05$) in these values between the two tests, namely from 8.08% to 6.83% from the initial to the final testing. Also, the final HbA1c values of group A showed a significant decrease compared to group B subjects (Fig. 1).

Table II
HbA1c values of the experimental group (A).

n	Subjects	Initial test		Final test	
		HbA1c values (%)		HbA1c values (%)	
1	B.A.	7.9		6.5	
2	B.C.	8.2		7.2	
3	B.M.	8.4		7.5	
4	B.R.	7.8		6.9	
5	D.F.	8.7		7.6	
6	F.S.	8.1		6.8	
7	H.K.	7.5		6.2	
8	J.T.	7.6		6.1	
9	N.N.	7.9		6.4	
10	N.S.	7.8		7.1	
11	P.I.	8.8		7.5	
12	V.O.	8.2		6.1	
	Mean	8.08		6.83	

Table III
HbA1c values of the control group (B).

n	Subjects	Initial test	Final test
		HbA1c values (%)	HbA1c values (%)
1	A.F.	8.1	7.9
2	B.L.	7.4	7.6
3	C.S.	8.7	8.7
4	C.R.	9.3	9.1
5	D.M.	7.9	7.6
6	E.P.	7.8	8.00
7	K.B.	8.9	8.5
8	M.S.	6.9	7.1
9	M.R.	10.2	10.1
10	O.J.	7.7	8.0
11	R.D.	9.1	8.6
12	Z.A.	8.2	8.9
	Mean	8.35	8.34

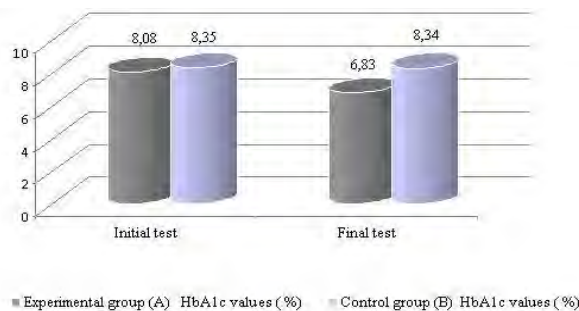


Fig. 1 – Chart of the progress of the mean HbA1c values.

Discussion

The analysis and interpretation of the experimental results revealed significant differences between the two groups of subjects in terms of metabolic response to predicted (group A) and unpredicted (group B) exercise, so (Tables II and III):

- The risk of hypoglycemic episodes decreased significantly with the conducted physical exercise program of known duration and intensity, evidencing the possibility of an adequate intervention on insulin dosage and carbohydrate intake. The episodic presence of severe hypoglycemia, as well as the persistence of moderate or mild hypoglycemia, even in a low percentage, acknowledges the results of specialized studies conducted in recent decades, according to which hypoglycemia is the limiting factor when performing exercise sessions in insulin-treated diabetic patients (Wentholt et al., 2007).

- The high glycemic fluctuations and the persistence of hypoglycemia recorded in a high percentage in the control group (B) confirm the theories according to which unplanned exercise averts from appropriate corrective interventions, metabolic response being unpredictable in this case. In these situations, practicing physical exercise outside advice and medical supervision could lead to an altered metabolic balance and to a higher risk of diabetes side effects (severe hypoglycemia, hyperglycemia, ketosis) (Chase et al., 2001).

- The significant difference between the mean HbA1c values of the two groups, as well as within the experimental group between the initial and final testing, reveals the beneficial effect of exercise on a long-term glucose balance in T1D patients. In group A, 58% of

the subjects managed through the conducted program to achieve an optimal therapeutic target, i.e. lowering HbA1c values below 7%. The remaining 42% of the subjects in the same group reached by controlled exercise mean HbA1c values slightly above the optimal average of 7%, which is explained by their higher initial values at the beginning of the experiment. The results of inferential statistics for this group, by assessing „t” Student test, indicates a statistically significant difference ($t=3.74$, $p < 0.05$) between the initial and final HbA1c values for groups with $n=12$. As for the control group (B), assessing „t” Student test indicates a statistically insignificant difference ($t=0.72$, $p > 0.05$) between the initial and final HbA1c values for groups with $n=12$.

- The correlation of the mean HbA1c values at the end of the exercise program with the progress of hypoglycemic episodes in the control group (B) is insignificant, unlike in the experimental group (A), where the essential correction criteria were applied, so the subsequent therapeutic objective pursued is coupled with a significant reduction of this side effect of type 1 diabetes.

- Regarding insulin dosage, regular reports analyzing the subjects of the two investigated groups show different approaches to its management strategy. Group A consists of subjects treated with multiple insulin administration (4-5 times daily). This scheme was shown to be highly effective for the duration of the exercise program, allowing appropriate insulin dose adjustments by 10-30% decreases during exercise practice. The correction at a narrower range of group B subjects (5-10%) confirms the results of previous studies, whereby twice-daily insulin dosing is a more rigid regimen, requiring a greater amount of time to achieve the therapeutic goals (Vereşiu et al., 2004; Nita & Hâncu, 2008).

- Achieving a good glycemic control in the subjects of the experimental group (A) was also due to their adequate diet adjustment. The slowly absorbed carbohydrate intake 2-3 hours prior to exercise significantly contributed to the restoration of glycogen stores and their slow depletion rate, which led to a significant decrease in post-exercise hypoglycemia. Most subjects in this group were able, during the course of the experiment, to develop their own algorithm based on individual glucose metabolic response.

Conclusions and proposals

1. The results of our experimental study confirms the research hypothesis, according to which the implementation of a systematic and conducted moderate-intensity exercise program reduces the frequency and severity of hypoglycemic episodes, under a flexible insulin treatment scheme and a permanent adjustment of carbohydrate intake, leading to a long-term metabolic balance in patients with type 1 diabetes.

2. The continuous evaluation of our experiment subjects meets previous findings in this field, according to which therapeutic T1D management team experience, as well as the patient are key elements in choosing the appropriate treatment scheme.

3. The progress of the subjects' metabolic response to our program leads to the proposed extension of systematic exercise programs for all age groups within ASCOTID

Mureş, where initial glycemic balance and the absence of major T1D complications allow their performance.

4. We propose a screening procedure within primary, secondary and high school institutions of Mureş county, based on the necessity of practicing exercise among children and young insulin-treated patients, as well as presenting the results of our program during ASCOTID events, in order to increase patient responsiveness to new insulin-treatment experimental therapeutic programs.

5. The consolidation of the therapeutic T1D management team of ASCOTID Mureş (patient, physician, diabetologist, nutritionist, coach, psychologist) is vital, in order to meet a complex and effective approach to T1D treatment.

6. Encouraging sport performance in highly metabolically balanced patients or restarting it in patients reluctant to „assume this risk” are benchmarks for providing good practice examples.

7. The development of training programs organized by ASCOTID Mureş with the target group of physical education teachers will have as a main purpose the adaptation of curricula and sports training to the category of practitioners, where exercise is a way of treatment and maintenance of the quality of life.

Conflicts of interests

There are no conflicts of interests.

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Anthropometric and bio-impedance data in relation to physical independence in elderly

Date antropometrice și de bioimpedanță în relație cu menținerea independenței fizice la vârstnici

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Abstract

Background. Physical and functional changes occurring with age appear gradually and they inevitably progress over time, but the rate of progress is very different from one person to another. Sedentary elderly may lose fitness with age, up to loss of independence, and increased physical activity can counteract this, while being beneficial also in the development of chronic diseases.

Aims. All these changes occurring in the bone - muscle system can be identified by investigating the anthropometric indicators.

Methods. Two groups of elderly were studied: 116 institutionalized elderly, aged 65-84 years, 122 non-institutionalized elderly, aged 65-78 years. A series of anthropometric indicators as well as body composition were determined by the impedance method.

Results. Following determinations, a greater representation of fat mass compared to non-fat mass was found, especially in women, which were classified as overweight 2nd degree. The body mass index values obtained in the studied groups were correlated with skin fold values and were lower in non-institutionalized elderly people. Data processing also led to the obtaining of higher body fat levels (percentage and kg) in institutionalized elderly. The calculated total muscle mass evidenced higher values in the group of non-institutionalized elderly.

Conclusions. a) The proportion of fat is increased in both female groups compared to male groups. b) The differences between the mean fat tissue values in the two groups can be explained if we consider that institutionalized elderly have extremely reduced physical activity, either due to the lack of sport facilities in the institutions concerned or because of associated chronic diseases further limiting the exercise capacity. c) The assessment of nutritional status using the bio-impedance method provides important information on body fat and allows for a more careful monitoring of nutritional and cardiovascular risk.

Key words: elderly, anthropometry, bio-impedance, physical independence.

Rezumat

Premize. Modificările fizice și funcționale apărute cu înaintarea în vârstă apar treptat și progresează inevitabil în timp, rata de progresiune fiind însă foarte diferită de la o persoană la alta. Persoanele vârstnice sedentare pot pierde forma fizică odată cu vârsta, până la pierderea independenței, iar creșterea activității fizice poate contracara acest lucru, fiind benefic și pentru evoluția bolilor cronice.

Obiective. Toate aceste modificări, apărute la nivel osteomuscular, pot fi evidențiate prin investigarea indicatorilor antropometrici.

Metode. Au fost luate în studiu două loturi de vârstnici: 116 vârstnici instituționalizați, cu vârste cuprinse între 65-84 de ani și 122 vârstnici neinstituționalizați, cu vârste cuprinse între 65-78 de ani. S-au determinat o serie de indicatori antropometrici, precum și compoziția corporală prin metoda impedanței.

Rezultate. În urma determinărilor efectuate s-a observat o reprezentare mai mare a țesutului adipos față de masa neadipoasă, în special la femei, acestea încadrându-se în supraponderie gradul II. Valorile Indicelui de Masă Corporală obținute la loturile luate în studiu sunt corelate și cu valori pliurilor cutanate, la vârstnicii neinstituționalizați acestea fiind mai mici. Prelucrarea datelor a condus, de asemenea, și la obținerea unor valori mai mari ale țesutului gras (procentual și în kg) la vârstnicii instituționalizați. Masa musculară totală calculată evidențiază valori mai mari la lotul de vârstnici neinstituționalizați.

Concluzii. a) Proportia de țesut adipos este mai mare la ambele loturile feminine, comparativ cu cele masculine. b) Diferențele între valorile medii ale procentului de țesut adipos la cele două loturi sunt explicabile dacă ținem cont de faptul că la vârstnicii instituționalizați activitatea fizică este extrem de redusă, fie datorită lipsei de dotare a instituțiilor respective cu o sală de sport, fie datorită bolilor cronice asociate care limitează și mai mult capacitatea de efort. c) Evaluarea stării de nutriție prin metoda de bioimpedanță aduce informații importante legate de compartimentul de grăsimi și posibilitatea urmării mai atente a riscului nutrițional și cardiovascular.

Cuvinte cheie: vârstnici, antropometrie, bioimpedanță, independență fizică.

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Introduction

As we age, our body undergoes changes in many respects, which affect the functions of individual cells as well as of organs and systems. These inevitable changes occur gradually over time, but the rate of progress is very different from one person to another (Ciuciuc, 2011).

One of the most important factors influencing the quality of life in the elderly has been the maintenance of aerobic capacity and independence.

Regular exercise reduces the risk of obesity, diabetes, hypertension and cardiovascular disease, not only at middle ages but also after retirement age, and the maintenance of aerobic capacity at old age may be associated with the ability to maintain independence (***, 2002; Campillo et al., 2004; Stanciu, 2008).

Sedentary elderly may lose fitness with age, up to loss of independence, while increased physical activity may counteract it, being also beneficial for the development of chronic diseases (Thorpr et al., 2004).

Physical and physiological decline (musculoskeletal, cardiovascular, gastrointestinal, respiratory) may be associated with the aging process exacerbated by a number of spinal cord injuries. The rate of decline varies from one individual to another, being dependent on genetic heritage, customs, lifestyle and general health (Huges et al., 2004).

The effects of physical inactivity in the elderly translate into: osteoporosis, with an increase in fracture rates (femoral neck, spine, distal forearm), muscle weakness especially in the legs, with an increased risk of falls and decreased flexibility, with the occurrence of frequent accidents and injuries. Sedentary life increases the risk of cancer (colon, female genital apparatus) and causes a higher frequency of coronary artery disease and high blood pressure (Lazăr et al., 2007; Prelici & Barbat, 2007).

Musculoskeletal changes occurring in the elderly include:

- decrease in muscle mass,
- decrease in muscle fiber size and number of myofibrils.

All these changes at musculoskeletal level may be evidenced by investigating anthropometric indicators.

Nutrition and physical activity are effective ways to prevent chronic diseases such as atherosclerosis, hypertension, metabolic disorders and their complications. The WHO has published a series of guidelines on physical activity, whose effects on diabetes, cardiovascular disease, hypertension also translate into reduced demand for care in medical institutions, lower consumption of drugs, as well as maintenance of the autonomy of the elderly (Kondrup et al., 2003; Chen et al., 2007).

Numerous studies show that maintaining a workout schedule early in the adult period counteracts age-related decline in exercise capacity and increases the period of independence in the elderly (Gillette-Guyonnet et al., 2003; Forster & Gariballa, 2005; Keller, 2005; Reyes-Beaman, 2005; Harris et al., 2008).

Hypothesis

This study aims to assess comparative anthropometric and bio-impedance data in 2 groups of elderly in relation to

the maintenance of physical independence.

Materials and methods

Research protocol

To achieve the intended aim, we used a case-control study.

a) *Period and place of research*

The study was conducted in 2003-2004. Anthropometric data evaluation was performed in a group of institutionalized elderly in the Care and Support Center of Cluj-Napoca vs. a group of non-institutionalized elderly.

b) *Subjects and groups*

Two groups of elderly were studied:

- 116 institutionalized elderly, out of which:
 - 64 women, aged between 65-79 years;
 - 52 men, aged between 70-84 years;
- 122 non-institutionalized elderly, out of which:
 - 68 women, aged between 65-79 years;
 - 54 men, aged between 70-84 years;

The measurements were performed with the subject standing, but many elderly people had difficulties in maintaining an orthostatic position; some subjects were even confined to chair or bed for various conditions; the elderly who were not able to maintain postural position were excluded from this study.

c) *Test applied*

We used direct methods for the determination of anthropometric parameters such as height, weight, mean arm circumference, skin folds (tricipital, bicipital, suprailiac and subscapular), and the calculation of correlative indicators such as: body mass index (BMI), muscular arm circumference (MAC), arm muscular area (AMA), muscle mass (MM) and the amount of subcutaneous fat (Santos et al., 2004; Ciuciuc, 2011).

In this study, body composition in the elderly was also evaluated using the bio-impedance method - a non-invasive and quick method to assess the risk of nutritional status disorders.

d) *Statistical processing*

The results were expressed as arithmetic mean. Statistical analysis was performed using Microsoft Office Excel 2010.

Results

For interpreting the results, we divided the investigated subjects into two groups: institutionalized elderly (IE) and non-institutionalized elderly (nIE), both split per gender.

After calculating the BMI value for the studied elderly, the following results were obtained:

- IE group
 - women: BMI = 32.65 => overweight 2nd degree
 - men: BMI = 21.19 => normal weight
- nIE group
 - women: BMI = 31.05 => overweight 2nd degree
 - men: BMI = 22.03 => normal weight

The differences in BMI values may be explained by culinary traditions and lifestyle as well as genetics.

The results obtained in the groups under study were correlated with lower skin fold values in non-institutionalized elderly, thus explaining their lower average weight (Tables I and II).

Table I
Anthropometric parameters in non-institutionalized elderly.

Parameter	Gender	
	F	M
Age (years)	70.5	71.5
Height (cm)	159	165
Shank length (cm)	42.5	43
Weight (kg)	81	60
BMI	31.05	22.03
Shank perimeter (cm)	35.5	29
Brachial perimeter (cm)	34	25
Subscapular skin fold (cm)	3.7	0.9
Tricipital skin fold (cm)	2.7	0.9
Bicipital skin fold (cm)	3.1	0.7
Suprailiac skin fold (cm)	3.3	2
Fat tissue composition	40.6%	31.3%
	32.9 kg	17.8 kg

Table II
Anthropometric parameters in institutionalized elderly.

Parameter	Gender	
	F	M
Age (years)	72	77
Height (cm)	157.5	164
Shank length (cm)	41	43
Weight (kg)	78.5	57
BMI	32.65	21.19
Shank perimeter (cm)	36	27.5
Brachial perimeter (cm)	35	24
Subscapular skin fold (cm)	4.1	0.9
Tricipital skin fold (cm)	3.3	0.8
Bicipital skin fold (cm)	3.4	0.7
Suprailiac skin fold (cm)	3.8	2.5
Fat tissue composition	44.4%	36.3%
	36 kg	20.7kg

Data processing also showed higher levels of fat, in both percentage and net weight, in institutionalized elderly.

The calculated total muscle mass (TMM) evidenced higher values in the group of non-institutionalized elderly.

- IE group
 - women: TMM = 23.26 kg
 - men: TMM = 17.07 kg
- nIE group
 - women: TMM = 25.11 kg
 - men: TMM = 18.30 kg.

Even for non-adipose mass, the non-institutionalized elderly had values higher than those of the institutionalized elderly of both genders (Tables III and IV).

Table III
Body composition parameters in non-institutionalized elderly.

Parameter	Gender	
	F	M
Age (years)	72	77
Adipose mass (%)	52.3%	42%
Adipose mass (kg)	42.36	23.52
Total muscle mass (kg)	23.26	17.07
Non-adipose mass (kg)	38.63	33.48

Table IV
Body composition parameters in institutionalized elderly.

Parameter	Gender	
	F	M
Age (years)	70.5	71.5
Adipose mass (%)	44.9%	41%
Adipose mass (kg)	35.24	24.6
Total muscle mass (kg)	25.11	18.30
Non-adipose mass (kg)	43.26	35.4

Discussion

Following measurements, higher adipose mass values compared to non-adipose mass values were found, especially in women, which were classified as overweight 2nd degree – which was also a useful indicator in assessing cardiovascular risk.

A greater muscle mass in non-institutionalized elderly explains some of their higher weight compared to institutionalized elderly.

Also, the lack of activity in the group of institutionalized elderly and a series of associated chronic diseases cause a higher muscle mass loss.

By analyzing the results of lean muscle mass, adipose mass percentage and average weight in the two groups, we can explain the weight difference not only in terms of muscle mass but also of body fat percentage.

Comparative bio-impedance data show a lower adipose mass percentage in non-institutionalized elderly, with a greater difference in women, 7.4%, while in men the difference is only 1%.

Muscle tone and physical and mental health are also better in non-institutionalized persons. The same is true for fat mass expressed in kg, where the difference between the two genders is surprisingly great. If fat mass is 42.36 kg in institutionalized women and 35.24 kg in non-institutionalized women, in men, fat mass is 23.52 kg and 24.6 kg, respectively.

Total muscle mass expressed in kg is lower in institutionalized elderly compared to non-institutionalized elderly. In women, total muscle mass is 23.26 kg and 25.11 kg, respectively, while in men, it is 17.07 kg and 18.30 kg, respectively.

Conclusions

1. The proportion of adipose tissue is increased in both female groups compared to males. The mean percentage values of adipose tissue out of the total weight fall into the 2nd degree of obesity in women, while in the group of men, values remain within normal weight.

2. These differences can be explained if we consider that institutionalized elderly have extremely reduced physical activity, either because of the lack of facilities (a gym, for example), or because of associated chronic diseases which further limit the exercise capacity.

3. The assessment of nutritional status using the bio-impedance method provides important information about body fat and a better traceability of nutritional and cardiovascular risk. Therefore, the bio-impedance method should be introduced in the medical assessment of the elderly.

4. The investigation of nutritional status in elderly communities is an important issue of preventive medicine. The assessment of nutritional status may detect possible nutritional deficits at an early stage. Evaluation in this age group is also required because of physiological changes occurring in the aging process.

5. The results obtained recommend a greater involvement of the elderly in various social activities, as well as in family activities, which allows for maintaining their sense of utility, a particularly important factor for the

maintenance of good nutrition and indirectly, good health. It avoids the occurrence of depression, commonly seen in the elderly.

Conflicts of interest

There are no conflicts of interests.

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Anthropometric indicators and aerobic exercise capacity in young basketball players

Indicatorii antropometrici și capacitatea aerobă de efort la jucătorii de baschet tineri

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Abstract

Background. The current tendencies of modern basketball involve multilateral and specific high level physical training, adapted to the peculiarities of age and level of training.

Aims. The anthropometric indicators and exercise capacity in the pre-competition period were studied in junior basketball players with specific training and pupils with general sports training.

Methods. Our research was performed in 6 groups (n=10 subjects/group), group I (15 years), group II (16 years), group III (17 years), controls, and group IV (15 years), group V (16 years), group VI (17 years), athletes. The monitored anthropometric parameters were: weight, height and indirectly, the body mass index. The exercise capacity indicators were: maximal O₂ consumption and maximal aerobic power.

Results. Insignificant increases in the weight, height and body mass index were found in the athlete groups compared to the non-athlete groups, except for the 17-year group for height. Significant increases in VO₂ max and maximal aerobic power were found in athletes compared to non-athletes of the same age.

Conclusions. Specific sports training determines an increase in aerobic exercise capacity and maximal aerobic power in young basketball players.

Key words: basketball players, VO₂ max, anthropometric indicators, physical exercise.

Rezumat

Premize. Tendințele actuale ale baschetului modern presupun o pregătire fizică multilaterală și specifică la un nivel ridicat, adaptată particularităților vârstei și nivelului de pregătire.

Obiective. S-au studiat indicatorii antropometrici și capacitatea de efort în perioada precompetițională la jucătorii de baschet juniori cu pregătire specifică și la elevii cu pregătire sportivă generală.

Metode. Cercetările au fost efectuate pe 6 loturi (n=10 subiecți/lot), lotul I (15 ani), lotul II (16 ani), lotul III (17 ani), martori și lotul IV (15 ani), lotul V (16 ani), lotul VI (17 ani), sportivi. Indicatorii antropometrici determinați au fost: greutatea înălțimea și indirect indicele de masă corporală. Indicatorii pentru capacitatea de efort au fost: consumul maxim de O₂ și puterea maximă aerobă.

Rezultate. Se observă creșteri ne semnificative ale masei corporale, înălțimii și indicelui de masă corporală la loturile de sportivi față de loturile de nesportivi, cu excepția loturilor de 17 ani pentru înălțime. Se observă creșteri semnificative ale VO₂max și a puterii maxime arobe la sportivi, față de nesportivii de aceeași vârstă.

Concluzii. Pregătirea sportivă specifică determină creșterea capacității arobe de efort și a puterii maxime arobe de efort la jucătorii de baschet tineri.

Cuvinte cheie: baschetbaliști, VO₂max, indicatori antropometrici, efort fizic.

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Introduction

The extremely high requirements in modern basketball, characterized by the tendency towards exercise intensification, increase in the speed of movement and execution, lead to the fatigue of the central nervous system, manifesting by the decrease of concentration capacity, and to the overstrain of the myoarthrokinetic, acoustic and vestibular analyzers, which ensure the balance function during jumping.

Primary selection in basketball takes place at the age of 7-9 years based on the following indicators: very good health; good physical development (tall or very tall children, with a good weight balance).

Secondary selection is performed at the age of 12-14 years. A secondary post-selection study for the age of 14-15 years presents the following data: guards have a height of 185-188 cm, forwards 190-196 cm, and centers 200 cm, with an arm span of 195-205 cm and a longitudinal and transverse palmar diameter of 20-21 cm, 24-25 cm, respectively (Dragnea, 1996).

Final selection is intended for athletes that have undergone the previous selection stages and refers to evaluation under playing conditions, which is the real selection criterion that evidences talent.

According to Colibaba & Sufariu (2005), the motor structure of play determines three types of functional strain: aerobic, with an alternative or predominantly mixed manifestation; anaerobic alactacid; anaerobic lactacid. The alternation or the combination of strains occurs within the limits of the following relative values: 10-30 sec – anaerobic alactacid + anaerobic lactacid; 30-90 sec – anaerobic lactacid + anaerobic alactacid; 90-120 sec – anaerobic lactacid + aerobic.

Hypothesis

Height, weight, the body mass index and physiological data may significantly contribute to the improvement of selection methods in the case of young basketball players, but they cannot determine in a high proportion individual sports performance.

Material and methods

Research protocol

a) Period of the research

The research was approved by the Ethics Board of the "Iuliu Hațieganu" University of Medicine and Pharmacy Cluj-Napoca and the informed consent of the subjects' parents was obtained. The determination period was May 2012 for groups I, II and III, and for groups IV, V and VI, three weeks in May 2013, after training.

Subjects and groups

The determinations were performed in 6 groups (n=10

subjects/group):

- 3 control groups; CI (15 years), CII (16 years), CIII (17 years)

- 3 groups of athletes; AIV (15 years), AV (16 years), AVI (17 years)

The groups of young professional athletes were members of the "U Mobitelco" Club Cluj-Napoca and the control groups were pupils of the Informatics High School in Cluj-Napoca.

b) Tests applied

Anthropometric indicators

- direct - weight (G) in kg, by weighing with a digital scale, and height (H) measured in cm using a stadiometer, for the determination of the body mass index (BMI);

- indirect - BMI, calculated using the formula G/H^2 (kg/m²).

Aerobic exercise capacity (AEC) was indirectly investigated using the Åstrand-Ryhming method (Drăgan 2002); 6 minute submaximal exercise, performed on the Ergoline 900 cycloergometer (commercialized by Tehnomed SRL, Cluj-Napoca), with a 40-80/min rotation and 2.5 W/Kg intensity, maintained constant throughout the duration of the test.

The aerobic exercise indicators were:

- maximal O₂ consumption in ml (VO₂max);

- maximal aerobic power in ml/kg (MAP=VO₂max/G);

c) Statistical processing

Statistical processing was performed using the Excel application (Microsoft Office 2007) and the StatsDirect v.2.7.2 software. The results were graphically represented using the Excel application (Microsoft Office 2007).

Results

a) Comparative statistical analysis of anthropometric indicators in the studied groups

Body mass (Table I)

The statistical analysis of body mass values, *considering all groups*, showed very statistically significant differences between at least two of the groups (p=0.001).

The statistical analysis of body mass values, *considering all control groups*, revealed statistically significant differences between at least two of the groups (p=0.0322).

The statistical analysis of the body mass values, *considering all athlete groups*, indicated highly statistically significant differences between at least two of the groups (p=9.64x10⁻⁵).

The statistical analysis of body mass values *for unpaired samples* showed:

- highly statistically significant differences between groups A15-A16 and A15-A17 (p<0.001)

- statistically significant differences between groups C15-C16 and C15-C17 (p<0.05).

Table I

Comparative analysis of body mass values (measured in kg) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p)	
C15	59.3	3.7861	56	11.9727	45	80	C15-C16: 0.0218	C15-A15: 0.1004
A15	52.2	3.2755	50.5	10.3580	40	76	C15-C17: 0.0243	C16-A16: 0.9717
C16	72.5	4.3621	71.5	13.7941	55	95	C16-C17: 0.8541	C17-A17: 0.7598
A16	72.3	3.4417	72	10.8837	50	89	A15-A16: 0.0005	
C17	73.7	4.7259	72.5	14.9447	55	105	A15-A17: 0.0002	
A17	72	2.7203	72.5	8.6023	59	89	A16-A17: 0.9463	

Height (Table II)

The statistical analysis of height values, *considering all groups*, evidenced highly statistically significant differences between at least two of the groups ($p=3.42 \times 10^{-8}$).

The statistical analysis of height values, *considering all control groups*, showed very statistically significant differences between at least two of the groups ($p=0.00345$).

The statistical analysis of height values, *considering all athlete groups*, revealed highly statistically significant differences between at least two of the groups ($p=3.31 \times 10^{-6}$).

The statistical analysis of height values *for unpaired samples* evidenced:

- highly statistically significant differences between groups A15-A16 and A15-A17 ($p<0.001$)
- very statistically significant differences between groups C15-C17 ($p<0.01$)
- statistically significant differences between groups C15-C16 and C17-A17 ($p<0.05$).

Body mass index (Table III)

The statistical analysis of body mass index (BMI) values, *considering all groups*, showed no statistically significant differences between the groups ($p=0.3281$).

The statistical analysis of BMI values, *considering all control groups*, revealed no statistically significant differences between the groups ($p=0.2829$).

The statistical analysis of BMI values, *considering all athlete groups*, evidenced no statistically significant differences between the groups ($p>0.05$)

The statistical analysis of BMI values *for unpaired samples* showed no statistically significant differences between the groups ($p>0.05$).

b) Comparative statistical analysis of exercise capacity in the studied groups

Maximal oxygen consumption - VO_2 max (Table IV)

The statistical analysis of VO_2 max values, *considering all groups*, evidenced highly statistically significant differences between at least two of the groups ($p=1.07 \times 10^{-8}$).

The statistical analysis of VO_2 max values, *considering all control groups*, showed statistically significant differences between at least two of the groups ($p=0.0283$).

The statistical analysis of VO_2 max values, *considering all athlete groups*, revealed highly statistically significant differences between at least two of the groups ($p=0.0003$).

The statistical analysis of VO_2 max values *for unpaired samples* showed:

- highly statistically significant differences between groups A15-A17 and C17-A17 ($p<0.001$)
- very statistically significant differences between groups A15-A16 and C16-A16 ($p<0.01$)
- statistically significant differences between groups C15-C16, C15-C17 and C15-A15 ($p<0.05$).

Maximal aerobic power (Table V)

The statistical analysis of maximal aerobic power (MAP), *considering all groups*, showed highly statistically significant differences between at least two of the groups ($p<0.0001$).

The statistical analysis of MAP values, *considering all control groups*, evidenced no statistically significant differences between the groups ($p=0.4033$).

The statistical analysis of MAP values, *considering all athlete groups*, indicated statistically significant differences between at least two of the groups ($p=0.0206$).

The statistical analysis of MAP values *for unpaired*

Table II

Comparative analysis of height values (measured in m) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p)	
C15	1.68	0.0294	1.70	0.0931	1.47	1.80	C15-C16: 0.0138	C15-A15: 0.183
A15	1.61	0.0408	1.61	0.1289	1.39	1.85	C15-C17: 0.0045	C16-A16: 0.2739
C16	1.78	0.0210	1.76	0.0665	1.68	1.87	C16-C17: 0.5285	C17-A17: 0.0113
A16	1.82	0.0284	1.81	0.0899	1.68	1.96	A15-A16: 0.0006	
C17	1.80	0.0208	1.78	0.0657	1.73	1.92	A15-A17: 3.75×10^{-5}	
A17	1.88	0.0223	1.88	0.0705	1.75	1.96	A16-A17: 0.0899	

Table III

Comparative analysis of BMI values (measured in kg/m^2) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p)	
C15	20.94	0.8746	20.45	2.7659	18.29	26.73	C15-C16: 0.2176	C15-A15: 0.7245
A15	20.60	1.6898	19.87	5.3437	13.15	29.50	C15-C17: 0.1655	C16-A16: 0.59
C16	22.82	1.0243	23.14	3.2392	18.62	28.06	C16-C17: 0.9061	C17-A17: 0.0577
A16	21.97	1.1706	21.47	3.7018	17.10	30.12	A15-A16: 0.516	
C17	22.65	0.9464	22.62	2.9928	18.38	28.48	A15-A17: 0.8764	
A17	20.31	0.6431	19.95	2.0335	17.24	23.55	A16-A17: 0.2363	

Table IV

Comparative analysis of VO_2 max values (measured in ml/min) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p)	
C15	1970	97.8093	1950	309.3003	1600	2600	C15-C16: 0.0217	C15-A15: 0.0408
A15	2360	145.4495	2200	459.9517	1800	3400	C15-C17: 0.0187	C16-A16: 0.0016
C16	2360	119.4432	2450	377.7124	1700	2800	C16-C17: 0.8662	C17-A17: 0.0002
A16	3040	139.2041	3050	440.2020	2100	3600	A15-A16: 0.0034	
C17	2390	128.6252	2350	406.7486	1800	3200	A15-A17: 0.0004	
A17	3140	88.4433	3200	279.6824	2600	3600	A16-A17: 0.5534	

samples revealed:

- highly statistically significant differences between groups C15-A15, C16-A16 and C17-A17 ($p < 0.001$);
- very statistically significant differences between groups A15-A16 ($p < 0.01$).

a) *Statistical analysis of correlation between the studied indicators* (Table VI)

Discussion

In the literature, the majority of the authors have studied the exercise capacity of adult and young basketball players aged over 18 years, at various levels (middle level – national teams).

Physiological anthropometric indicators may significantly contribute to the improvement of selection procedures in the case of adolescent basketball players.

Our data are in accordance with the literature data regarding height, for groups A16 and A17 (Gurău, 2002), and body mass, for groups A15, A16 and A17 (Cordun, 2009).

Studies carried out by Jelacic et al. (2002) using anthropometric measurements in young basketball players show that players in the center position are characterized by a prominent size of the skeleton in longitudinal and transverse plane, as well as of the circumference, but they present no significant differences compared to players in the forward position. Center players are predominantly ectomorph compared to the other players, while players in the guard position are predominantly mesomorph.

In a study performed by Torres-Unda et al. (2013), following anthropometric determinations, it was found that weight, height and muscle percentage were higher in elite basketball players. These indicators associated with maturity are important for determining success.

Faludi et al. (1999), in a study on aerobic exercise capacity in mini-basketball players (7-9 years) show that this is determined by a number of factors such as: the genetic factor, physical development, and exercise tolerance. The results of the study demonstrated that the study group had a better exercise tolerance and cardiorespiratory capacity than the control group. The performance of the first group was not due to the degree of physical development.

Training exercise, particularly in junior players, is below the level of exercise during the game and should be raised to higher physiological rates, according to the specificity of the basketball play. This attitude of continuous correction, adjustment to the "physical reality" in the field will be a determining factor for constant progress (Feflea, 2009).

A study on the recovery period after maximal exercise in male basketball players carried out by Gocentas & Andziulis (2004) shows that total recovery time was long, 1200s, but certain processes were completed earlier: accumulation of lactic acid at 95s, oxygen uptake at 620s, normalization of heart rate at 730s.

A meta-analysis conducted by Ziv & Lidor (2009) regarding sports performance in basketball players found that maximal aerobic capacity values ranged between 44-54 and 50-60 ml O₂/kg/min. Play leaders performed higher intensity exercise than forwards and centers during a game.

Castagna et al. (2009) examined VO₂ max in basketball players. Values during training were 60.88±6.26 and 50.33±3.98 for juniors and seniors, respectively. The results show that a value of 50 ml x kg x min is sufficient to practice middle level basketball.

In a study on aerobic exercise capacity based on the Astrand-Ryhming test applied before and after training for 21 days, Boroş-Balint (2012) evidenced an increase in post-training VO₂, which indicates a good adaptation of

Table V

Comparative analysis of MAP values (measured in ml/kg) in the studied groups and statistical significance.

Group	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p)	
C15	33.49	0.6505	33.91	2.0570	28.75	35.56	C15-C16: 0.2713	C15-A15: < 0.0001
A15	45.31	0.8569	45.31	2.7097	38.60	48.08	C15-C17: 0.2544	C16-A16: 4.62 x 10 ⁻⁸
C16	32.76	0.7823	32.33	2.4740	28.42	37.10	C16-C17: 0.8909	C17-A17: 9.59 x 10 ⁻⁹
A16	42.10	0.4889	42.18	1.5461	39.74	45.21	A15-A16: 0.0052	
C17	32.63	0.5704	32.60	1.8039	30	35.38	A15-A17: 0.2176	
A17	43.81	0.8664	44.33	2.7397	39.47	47.76	A16-A17: 0.1081	

Table VI

Statistical analysis of correlation between the values of the studied indicators.

Indicator	Group						
	C15	C16	C17	A15	A16	A17	
Age – body mass	0.5688 ***	0.5825 ***	0.0083 *	0.6162 ***	-0.0345 *	0.2403 *	
Age – height	0.656 ***	0.6033 ***	-0.0608 *	0.2160 *	0.4145 **	0.3039 **	
Age – BMI	0.3939 **	0.4882 **	0.0808 *	0.3794 **	-0.3104 **	0.0253 *	
Age – HR	0.2457 *	0.1765 *	0.1013 *	-0.1625 *	0.6600 ***	0.3129 **	
Age – VO ₂ max	0.5139 ***	0.4235 **	-0.0562 *	0.5643 ***	-0.1693 *	0.0345 *	
Body mass – height	0.8313 ****	0.7600 ****	0.9301 ****	-0.0810 *	0.2734 **	0.5495 ***	
Body mass – BMI	0.6667 ***	0.9439 ****	0.9774 ****	0.7915 ****	0.7970 ****	0.7802 ****	
Body mass – HR	0.0572 *	0.1414 *	0.3052 **	-0.1938 *	-0.0047 *	0.6799 ***	
Body mass – VO ₂ max	0.9846 ****	0.9149 ****	0.9700 ****	0.9487 ****	0.9666 ****	0.8451 ****	
Height – BMI	0.2492 *	0.5060 ***	0.8370 ****	-0.6532 ***	-0.3572 **	-0.0908 *	
Height – HR	0.0136 *	0.2933 **	0.1168 *	0.0928 *	0.3867 **	0.2989 **	
Height – VO ₂ max	0.7837 ****	0.6803 ***	0.9631 ****	0.0165 *	0.2110 *	0.5532 ***	
BMI – HR	0.2203 *	0.0421 *	0.3403 **	-0.1244 *	-0.2889 **	0.5964 ***	
BMI – VO ₂ max	0.6728 ***	0.8806 ****	0.9171 ****	0.6578 ***	0.8102 ****	0.5993 ***	
HR – VO ₂ max	0.0701 *	-0.0780 *	0.1379 *	-0.4154 **	-0.2253 *	0.2436 *	

Correlation: **** very good, *** good, ** acceptable, * weak.

the body regarding maximal O₂ uptake, O₂ transport and consumption systems for exercise.

The research performed by Vamvakoudis et al. (2007) was aimed at determining the effects of basketball training on maximal aerobic power, isokinetic strength, mobility and body fat index. On the initial test, basketball players had a lower heart rate and a higher VO₂ compared to the control group. After 18 months, there were no significant differences in isokinetic strength and mobility between the two groups, but basketball players had a lower body fat index.

Sallet et al. (2005) evaluated the physiological characteristics and physical capacities of basketball players competing in the first and second basketball divisions and their correlation with the position of each player and the level of play: centers had a lower maximal speed than play coordinators and forwards; the VO₂ max level of first league players was significantly lower than that of lower division players, and the fatigue index was higher in first division players; the general aerobic capacity was similar between players competing in different positions, despite certain differences between athletes, determined by individual physiological capacities.

Castagna et al. (2008) examined the effects of maximal aerobic power on the repeated sprint ability (calculated as the decrease of performance and total sprint time) in young basketball players. The results of this study indicate that VO₂ max is not a predictive factor for the repeated sprint ability in young basketball players. The high blood lactate concentrations found at the end of the repeated sprint ability protocol suggest its use for the development of lactate tolerance in trained basketball players.

Hoffman et al. (1999) studied the effect of aerobic capacity on performance, fatigability and heart rate recovery after high intensity anaerobic exercise in national level basketball players. A weak or no correlation was evidenced between aerobic capacity and recovery indicators after high intensity exercise in basketball players.

Tavino et al. (1995) monitored the effects of basketball training in the pre-season period and during a season on the aerobic capacity, anaerobic capacity and body composition in basketball players aged between 18 and 22 years. The tested parameters included body fat percentage, a functional capacity test, and an anaerobic capacity test. The study included three testing phases (during the pre-season, 5 weeks after pre-season training, at the end of the season). The results suggest that the players had significant body fat decreases. Aerobic capacity did not improve during the pre-season period. The players also lost their aerobic capacity during the season.

Conclusions

The following changes were found in the athlete groups:

1. Insignificant increases in body mass, height and body mass index in the athlete groups compared to the non-athlete groups, except for the 17-year groups for height.

2. Significant increases in VO₂max and maximal aerobic power in athletes, compared to non-athletes of the same age.

Conflicts of interests

Nothing to declare.

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Body posture investigation in athletes – middle-distance and long-distance races

Investigarea posturii corporale la atleți, probe de semifond-fond

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Abstract

Background. Body posture develops gradually, after repeated experiences, as a result of maintaining the same positions and executing the movements in the same way, in similar situations.

Aims. The study aims to highlight the views of former performance athletes in middle-distance and long-distance races on the relation between training and body posture.

Methods. The questionnaire was applied to 32 former middle-distance and long-distance runners aged between 19 and 23, who had given up on sports activity 1-3 years before. We applied a 15-item questionnaire with multiple pre-coded answers. Applying the mirror test required the subjects to objectively consider their own posture.

Results. In 167 cases, a correct posture was indicated, and only in 25 cases, the posture was reported as inadequate for frontal plane examination. Pearson’s correlation coefficient (r) is 0.72, at a significance threshold of 0.01, which indicates a strong correlation between the ideal body posture and the body posture examined in frontal plane. Concerning lateral examination, the subjects identified 91 nominations for correct positions at the level of various segments and 69 situations that did not correspond to the correct posture. The relation between the ideal body posture and the body posture examined in sagittal plane is strong: $r=0.79$ and $p=0.01$ significance threshold.

Conclusions. The results obtained allow us to continue our research and to use athletics means as a factor that favors maintaining normal posture and achieving sports performance.

Key words: athletes, body posture, middle-distance – long-distance

Rezumat

Premize. Postura corpului se dezvoltă treptat, în urma unor experiențe repetate, ca rezultat al menținerii pozițiilor și a executării mișcărilor, în situații asemănătoare.

Obiective. Studiul are drept scop evidențierea opiniilor foștilor atleți de performanță, în probele de semifond-fond, cu privire la relația dintre antrenament și postura corporală.

Metode. Au fost supuși chestionării un număr de 32 de foști alergători de semifond-fond cu vârsta cuprinsă între 19-23 de ani, care au renunțat la activitatea sportivă de 1-3 ani. Am aplicat un chestionar cu 15 itemi, cu răspunsuri multiple precodificate. Aplicarea testului în oglindă a necesitat din partea subiecților obiectivitate în vederea examinării posturii.

Rezultate. Au fost identificate 167 de situații ce indică o postură corectă și doar 25 ce nu corespundea cu postura corectă, la examinarea în plan frontal. Coeficientul de corelație (r) Pearson este de 0,72, la un prag de semnificație de 0,01, ce indică o relație puternică între postura corporală și postura examinată în plan frontal. La examinarea din lateral, subiecții au identificat 91 de nominalizări pentru poziții corecte la nivelul diferitelor segmente și 69 de situații care nu corespund posturii corecte. Legătura dintre postura corporală și postura corporală examinată din lateral este puternică: $r=0,79$ și pragul de semnificație $p=0,01$.

Concluzii. Rezultatele obținute ne îndreptăcesc să ne continuăm cercetarea și să utilizăm mijloacele atletismului ca pe un factor care să favorizeze menținerea posturii normale și obținerea performanței sportive.

Cuvinte cheie: atleți, postură corporală, semifond-fond.

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Introduction

In the international specialized literature, there are numerous studies regarding the body posture, for various sports branches. The conclusion is that children should be encouraged to practice sport, as it is a stimulating factor for the correction of spine abnormalities, taking into account that most of them are actually postural or functional misalignments (Santonja, 1996).

Several studies have assessed the spine in several sports populations, such as: swimmers (Pastor, 2000; Obayashi et al., 2012), gymnasts (Ohlen & Wredmark, 1989; Kums et al., 2007; Kruse & Lemmen, 2009), professional soccer players (Sainz de Baranda et al., 2001; Ribeiro et al., 2003) and amateur soccer players (Wodecki, 2002), weight lifters (Lopez-Minarro et al., 2007), tennis players (Barczyk-Pawelec et al., 2012). There have also been studies done on samples from other sports disciplines (Hellstrom et al., 1990; Boldori et al., 1999; Ferrer, 1998; Uetake et al., 1998; Wojtys et al., 2000; Neto Junior et al., 2004; Shiller & Ebersson, 2008; Lopez-Minarro et al., 2008; Rajabi et al., 2008; Bujanj et al. 2012). The aforementioned studies found alterations in the spinal structure, such as sagittal postural deformities and lumbar pain, both with a rather high incidence.

After assessing the spine in sagittal plane on a sample of 82 female gymnasts aged between 7 and 15, the author (Martinez, 2004) found an increase in the lumbar curvature; in swimmers, a high rate of spinal alterations was identified, with various abnormalities depending on the swimming style (Pastor, 2000). Another study on 78 professional soccer players found normal values of the spine in sagittal plane, though the maximal trunk flexion and the asthenic position indicated a kyphotic attitude (Sainz de Baranda, 2001). Uetake et al. (1998) assessed the spine in sagittal plane in a sample of 380 athletes. After comparing the groups, they demonstrated that the group of soccer players had lower kyphosis rates than the average, as well as normal limits concerning lordosis. In one of his works, Ashton-Miller (2004) started by wondering whether intense training could lead to hyperkyphosis in young athletes, mostly in immature athletes, because of mechanical overloading, lack of age-appropriate recovery and training duration.

As for the spinal morphology in canoeists and runners, the latter had significantly higher values for dorsal kyphosis compared to canoeists. No significant differences were found between the two samples of athletes concerning lumbar lordosis (Lopez-Minarro et al., 2009).

Thus far, in many studies, the authors concluded that it was necessary to elaborate a postural exercise routine in order to get a normal body posture and to ensure the harmonious growth of all structures, in order to consolidate the spine (Obayashi et al., 2012).

In this paper, we tried to identify the relation between sports training and the body posture by investigating both the opinions and the postures of former middle-distance and long-distance runners. We also tried to use the results obtained in a subsequent research, with the purpose of demonstrating the effectiveness of athletics means in maintaining a harmonious posture or in correcting an abnormal posture, thus leading to sports performance.

Hypothesis

By knowing the opinions of former performance athletes (middle-distance and long-distance runners) and the body posture influenced by their sports activity, new approaches can be discovered regarding the use of athletics-specific exercise routines for maintaining or correcting the body posture.

Objectives

The purpose of the study is to underline the opinions of former middle-distance and long-distance performance runners regarding the relation between training and body posture.

For this study, we proposed the following objectives:

- Identifying possible joint pain;
- Assessing the body posture by using the mirror test, as well as the examination in frontal and anterior-posterior plane;
- Identifying the factors with a possible negative impact on the body posture;
- Identifying the need of a kinesiotherapist during the regular medical check-up;
- Identifying the coach's attitude on the use of certain exercises for the correction of the body posture.

Material and methods

Research protocol

a) *Period of the research*

The research took place in the period January–June 2012, in the following cities: Iași, Tg. Mureș and Bucharest. The questionnaire for the opinions was self-administered during the study period or during the summer session.

b) *Subjects and groups*

The research sample comprised a relatively small number of subjects (N=32, 15 females and 17 males), considering the small number of middle-distance and long-distance runners who ended their activity 1-3 years before, at both junior and senior level.

We mention that – in conformity with the Helsinki Declaration, the Amsterdam Treaty and Directive 86/609/EEC – we obtained the necessary license from the Ethics Commission within the National University of Physical Education and Sport in Bucharest, from the Faculty of Physical Education and Sport in Iași, from the University of Medicine and Pharmacy in Iași, as well as from the “Petru Maior” University in Târgu Mureș, for our research on human subjects and for the informed consent of the subjects included in the research.

c) *Tests applied*

The posture questionnaire (Rusu, 2009) was self-administered, and the subjects were asked to show honesty and objectivity in the self-assessment.

The working instrument had two parts: the independent variables (age, gender, race practiced, duration and level of athletics practice, time elapsed since giving up on sports activity) and the dependent variables (influence of posture on sports results, regular medical check-ups, disorders, injuries and pain throughout the sports career, efficiency in training and competition, self-assessment of posture in frontal and sagittal plane, factors that may

influence posture, presence of a kinesiologist, as well as the coach's attitude). The questionnaire comprised 15 items with dichotomous, pre-coded and open questions. The investigation of posture in the two planes (frontal and sagittal) was performed with the mirror test, recommended by the American Chiropractic Association.

d) Statistical processing

For result processing, we used SPSS (Statistical Pack for Social Science) version 15.0 for Windows, and for the graphs, Microsoft Office Excel 2003. For the mirror self-assessment, we applied Pearson's correlation test, with a 0.05 significance threshold. In addition, we represented all answers to the items as percentages.

Results

Item no. 1. *Do you believe that the body posture influences sports results?* The subjects – former performance athletes, who answered the questionnaire – unanimously agreed that the body posture had an influence on sports results. 56.3% of them had practiced athletics for 5-10 years, while 28.1% had been active for 11-16 years.

Item no. 2. *How many medical check-ups did you have throughout a competition year?* The medical check-up was seen as a point of interest for the respondents (84.4%), and they stated that they had two of them (39.4%) or as many as needed (42.4%). Only 18.2% of the respondents reported just one check-up throughout the entire competition year.

Item no. 3. *Who was present during the check-up?* The coach was directly interested in the health state of the athletes he trained, given that 53.1% of the former middle-distance and long-distance runners indicated that he was present, alongside the medical nurse (43.8%) and the sports physician. Hence, we can conclude that the coach works together with the sports physician and that he is aware of the results of regular medical check-ups.

Item no. 4. *Were you diagnosed with any condition throughout your sports career?* During their sports career, 21.9% of the former athletes stated that they had undergone investigations for various conditions, while 78.1% did not refer to any such conditions.

Item no. 5. *In case you were, what was the diagnosis?* The filter-question was addressed only to the seven subjects who answered "yes" to the previous question. They mentioned the following diagnoses: pneumonia, tweaked meniscus, swelling of the knee, calcaneus fracture, disc herniation, sprains and tachycardia.

Item no. 6. *What prevented you from achieving top efficiency during training or competitions?* The lack of top efficiency during training or competitions was reportedly due to the following factors: injuries (54.9%); bad state of the sports facility (40.6%); bad weather (21.9%) and muscle pain (18.8%).

Item no. 7. *By the time you resumed your sports activity, had you ever experienced any of the states below?* During their active years as athletes, the subjects experienced the following types of pain: spinal pain (31.3%); knee pain (40.6%); shoulder pain (3.1%); ankle pain (50%). 25% did not report any kind of pain.

Item no. 8. *How was training in the period you experienced pain?* When they were in pain, 12.5% said that training was the same; 37.5% said it was easier; 9.4% said

it was harder; 9.4% took a break; 34.4% said training was adjusted to pain, 12.5% said this was not the case.

Item no. 9. *When you look at yourself in the mirror, do you believe you have a normal body posture?* Of the 32 subjects, 29 (90.6%) considered that they had a normal body posture, without a detailed introspection on the position of certain body segments.

Item no. 10. *The mirror test – examination in frontal plane.* The application of the test required objectivity from the subjects for a frontal examination of the six sub-items. The following data were recorded (Fig. 1): 84.40% of the subjects had the shoulders on the same line; 90.60% had the head on the spinal axis, without deviations in frontal plane; 84.40% had approximately the same space between the arms and the body; 90.60% had the hips on the same line; 87.50% had the knees on the same line; 84.40% had the malleoli on the same line.

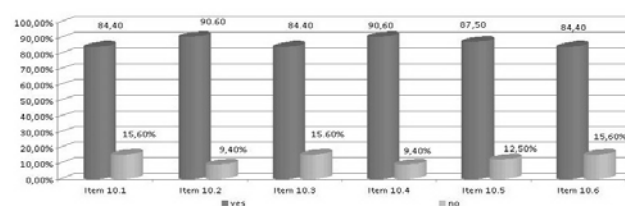


Fig. 1 – Representation of answers for self-examination in frontal plane.

Pearson's correlation coefficient (r) between the variables ideal body posture and posture examined in frontal plane is 0.72, with a significance threshold of $p=0.01$, which indicates a strong correlation between the two variables. Hence, if the posture is normal in frontal plane, the tendency is for the body posture to be ideal. The same variables applied to athletes who practiced middle-distance races indicate $r=0.55$, 0.01 significance threshold and a direct proportionality relation. Applied to former long-distance runners, Pearson's correlation is not significant, which indicates that there is no relation between the two variables.

Item no. 11. *The mirror test – examination in sagittal plane.* After self-examination, the subjects reported, in 58.6% of the cases, that the head was on the spinal axis; the chin was parallel to the floor for 62.1% of the subjects; 48.3% reported the shoulders to be on the same line; the abdomen was flat for 62.1% of the subjects, while the lumbar area presented a slight frontward curvature for 82.8% of the subjects (Fig. 2).

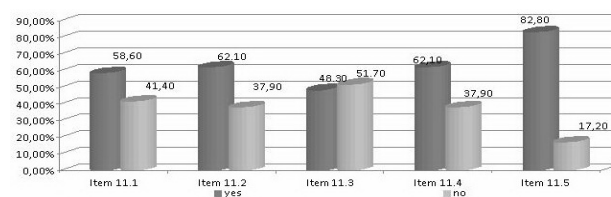


Fig. 2 – Representation of answers for self-examination in sagittal plane.

The relation between the variables ideal body posture and body posture examined in sagittal plane was determined

by applying Pearson's correlation to the entire group of subjects. We obtained $r=0.79$ and a significance threshold $p=0.05$, hence a strong correlation and direct proportionality. In the case of former middle-distance and long-distance runners, Pearson's correlation is also significant for the same variables, with a significance threshold of $p=0.05$. The relation is of direct proportionality: if the examination in sagittal plane indicates a normal posture, then the body posture is ideal.

Item no. 12. *Have you noticed any alteration in the body posture compared to the period when you were an active athlete?* 30 subjects (93.8%) answered affirmatively, as a consequence of the high incidence of pain during that period.

Item nr 13. *In your opinion, which of the following factors can have a negative influence on the body posture?* We recorded 87 nominations, among which the most frequent were the hump-backed position and unilaterally carrying the bags (21.8%), closely followed by the incorrect technique (20.7%) and by the incorrect position on the chair (19.5%). The lowest score was ascribed to weight-lifting training (16.1%). The respondents indicated as elements with the highest negative influence the habits acquired, followed by the technique and the weight-lifting training.

Item no. 14. *In order to identify in time the deviations from the normal body posture, do you believe a kinesiologist should also be present during the medical check-up?* In 93.75% of the cases, the athletes agreed that a kinesiologist should be present during the regular medical check-up.

Item no. 15. *In your opinion, what would the coach say about you suggesting certain exercises to correct the body posture?* The subjects said that the coach would be indifferent (15.6%), open (75%), or malicious (9.4%). The coach's attitude is very important in the relationship with the athletes, and it should be based on respect and trust.

Discussion

All the respondents agree that the body posture influences sports performance; 90.6% consider that they have a normal body posture, while 93.75% agree that a kinesiologist should be present during the regular medical check-up. It is also worth mentioning that 75% of the subjects agree that the coach's attitude would have been open to using exercises to correct the body posture.

Regarding the analysis of the medical check-up attendance depending on the level at which they practiced performance sport (local, national, international), we can state that local athletes tended to have only the two regular check-ups recommended by the coach, compared to national-level athletes, who had such check-ups whenever they considered it necessary. International athletes – because of their centralized individual practice and the permanent collaboration of the team of specialists – did not require additional check-ups, as they benefitted from permanent medical assistance.

Concerning the situations that limited the participation in training and competitions after getting diagnosed with various conditions, we cannot confirm or deny the influence of athletics in this sense without consulting anamnesis from a specialist, as well as the evolution of that condition,

monitored by the individual's physician.

For maximal efficiency in training and competitions, the limiting factors had a functional nature (54.9% injuries), and athletes attended the events under stress.

Taking into account that our subjects had been middle-distance and long-distance runners, we can state that the prevalence of pain in the ankles (50%), knees (40.6%) and spine (31.3%) is related to the type of sports practiced. The running stride specific to middle-distance and long-distance races is characterized by ampler vertical oscillations than speed races, which involves higher flight and more loading for lowering the amplitude, through a resistant muscle strain. The landing shocks are also felt by the spine (Radu, 2012). In the middle-distance and long-distance races, postural conditions are associated with the repetitive character of the running and with certain specific exercises executed while tired, which lead to more loading of the spine in the immature athlete (Shahrokhi et al. 2011). At the same time, spinal pain may be a source of the previous habits, which may cause dysfunctions for the rest of the individual's life (Briggs et al., 2007).

After getting an idea on how training took place when athletes experienced various types of pain, we conclude that the prevalence of pain was taken into consideration, thus making training easier for 37.5% of the athletes and adjusting it for 34.4%.

Regarding self-examination in frontal plane, the subjects identified 167 situations that indicated a correct posture and 25 situations showing deviations from the ideal posture. In sagittal plane, 91 nominations were made for the correct position of various segments and 69 situations were identified as presenting abnormalities. Compared to the examination in frontal plane, the examination in sagittal plane revealed more cases that did not correspond to a balanced posture.

Within the training of middle-distance and long-distance runners, there is not enough attention paid to the development of the abdominal back, shoulder and arm muscles. Consequently, a lack of balance occurs between the muscles of the lower limbs and the muscles of the upper trunk, which leads to spinal overloading during exercise. This lack of balance also leads to spinal conditions, such as scoliosis, kyphosis or lordosis.

In the opinion of Lichota et al. (2011), the level of anterior-posterior spinal curvatures depends on numerous factors, such as: somatic type, gender, lifestyle and physical activity.

A rapid and asymmetrical growth during the teenage years, combined with other elements that influence the body posture starting with childhood (carrying school backpacks, the hump-backed position, an incorrect position when sitting in the bench and inappropriate benches for age and height, an incorrect position on the chair, an uncomfortable bed, a big pillow, etc.), in the presence of weak muscles and low muscle tone, are important causes that may influence the development of spinal deformities (Bogdanovic & Marcovic, 2010).

Conclusions

1. The results of this research indicate that the posture of middle-distance and long-distance runners has a 100% influence on sports outcomes, while top efficiency in

training and competitions is influenced by the health state, as well as by injuries and muscle pain: 54.9% and 18.8%, respectively.

2. The deviations from the ideal body posture reflect an increased prevalence in sagittal plane, compared to those in frontal plane; the causes include the hump-backed position, unilaterally carrying the bags, incorrect technique and incorrect position on the chair.

3. The data obtained from this research may be considered a starting point in improving the training means aimed at achieving sports performance and preventing postural deformities, thus maintaining a correct posture in middle-distance and long-distance runners.

Conflicts of interests

Nothing to declare.

Contribution of authors

Făgăraș Pia-Simona – contribution to administering the questionnaire in Târgu Mureș and to elaborating the design for the SPSS database, version 15.0.

Vanvu Gynetta – contribution to administering the questionnaire in Iași and to elaborating the graphs in Microsoft Excel for Windows 2007.

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A biomechanical analysis of the acrobatic elements on the beam at the level of junior gymnasts 12-14 years old

Analiza biomecanică a elementelor acrobatice la bârnă la nivelul gimnastelor junioare de 12-14 ani

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Abstract

Background. The scientific argument is the highlighting of the kinematic and dynamic characteristics of the key components of sports technique on the beam, which, by computerized video biomechanical analysis, contributes to the establishment of the technical training level and methodological guidelines for the improvement of the technical execution.

Aims. The aim of this paper is the biomechanical analysis of the acrobatic elements on the beam at the level of junior gymnasts 12 to 14 years old. We consider that a video biomechanical analysis of the acrobatic elements on the beam would highlight the key components of sports technique in conformity with the performances achieved in competition.

Methods. This scientific approach led to the organization of an experimental study in the Deva junior team, applied to a group of 8 gymnasts, 12 to 14 years old. This research used the method of video biomechanical analysis by means of a specialized program named Physics ToolKit, monitoring the key components of sports technique of the acrobatic elements on the beam. The study was conducted during the period of the Masters National Championships of Onești 2012, in which there were monitored and recorded gymnasts' routines on the beam in the all-around event and the finals on this apparatus. The method used for statistical processing was Microsoft Office Excel 2003.

Results. The findings of the study emphasize the kinematic and dynamic characteristics of the acrobatic elements during the competition routines on the beam, freely executed, connected or mixed. In terms of the comparative analysis of the performances obtained in competition and of the biomechanical features of acrobatic elements which are key components in the sports technique on the beam, we pointed out the level of acrobatic training and some methodological guidelines for improving the technical execution.

Conclusions. The biomechanical analysis of the acrobatic elements on the beam highlighted the kinematic and dynamic features of the key components of the sports technique and their influence on the performances achieved in competition.

Key words: biomechanical analysis, beam, performance, sports technique.

Rezumat

Premize. Evidențierea caracteristicilor cinematice și dinamice ale componentelor cheie ale tehnicii sportive la bârnă, prin analiza video biomecanică computerizată, contribuie la constatarea nivelului pregătirii tehnice și orientării metodologice de îmbunătățire a execuției tehnice.

Obiective. Scopul lucrării este analiza biomecanică a elementelor acrobatice la bârnă, la nivelul gimnastelor junioare de 12-14 ani. Pentru aceasta am considerat că efectuarea analizei video biomecanice a elementelor acrobatice la bârnă va evidenția componentele cheie ale tehnicii sportive, în concordanță cu performanțele obținute în concurs.

Metode. Acest demers științific a condus la organizarea unui studiu experimental constatativ în cadrul lotului de junioare de la Deva, aplicat unui grup de 8 gimnaste, de vârstă cuprinsă între 12-14 ani. În cercetare s-a folosit metoda analizei video biomecanice, cu ajutorul unui program specializat Physics ToolKit, urmărind componentele cheie ale tehnicii sportive pentru elementele acrobatice la bârnă. Studiul s-a realizat în perioada desfășurării Campionatului Național de Maestre, Onești, 2012, unde s-au urmărit și înregistrat evoluțiile gimnastelor la bârnă, în cadrul competiției la individual compus și finala la acest aparat. Metoda de prelucrare statistică a fost Microsoft Office Excel 2003.

Rezultate. Rezultatele studiului scot în evidență caracteristicile cinematice și dinamice ale elementelor acrobatice în cadrul exercițiilor de concurs la bârnă, executate liber, în legare sau mixt. Analiza comparativă a performanțelor obținute în concurs, cu caracteristicile biomecanice ale componentelor cheie ale tehnicii sportive ale elementelor acrobatice la bârnă, scoate în evidență nivelul pregătirii acrobatice și orientării metodologice de îmbunătățire a execuției tehnice.

Concluzii. Efectuarea analizei video biomecanice a elementelor acrobatice la bârnă, a evidențiat caracteristicile cinematice și dinamice ale componentelor cheie ale tehnicii sportive și influența acestora asupra performanțelor obținute în concurs.

Cuvinte cheie: analiza biomecanică, bârna, performanță, tehnica sportivă.

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Introduction

Artistic gymnastics has made outstanding progress, developing in accordance with the tendencies of high performance sport, but it also has its specific particulars, such as: increase of sports mastery, development and rivalry of competitive program complexity, processing of new routines, etc. (Vieru, 1997; Arkaev & Suchilin, 2004).

The specific features of each artistic gymnastics event are given by the structure and number of technical elements, by the complexity, originality, spectacular character materialized in the maximum effectiveness reached in competition (Niculescu, 2003). Thus, the technique is represented by a system of specific motor structures rationally and economically built, in order to obtain maximum efficiency in competition. The analysis of technique highlights the following components: *technical elements, technical procedure, style and basic mechanism* (Dragnea & Mate-Teodorescu, 2002). In gymnastics, the role of technical training is very important and in close interdependence with the other components; thus, the poor physical training of gymnasts leads to an inadequate technique, and consequently, to lack of success in competition. Also, good technical training based on good physical training, but in the absence of adequate psychological training, results in poor performance (Grigore, 2001).

Due to the impetuous dynamics of gymnastics competition, the number of technical elements created by the great male and female champions who have imposed themselves over time has increased considerably, some of these elements taking over, besides their coded names reflecting their biomechanical features, the name of those who have created and executed them with unique virtuosity (for example, the elements "Endo", "Tsukahara", "Comăneci", "Korbut", etc.) (Nicu, 1993).

Research and practice show that the efficiency of learning complex gymnastics elements is increased if the phasic structure of the elements is checked during the process of technical training. In line with this, the periods of movement with or without support can be identified in the technical structure of gymnastics routines (Arkaev & Suchilin, 2004). Several criteria can be used for splitting gymnastics elements into parts, such as pedagogical, psychological, physiological, biomechanical criteria, etc. The increase of the objectification level goes from the pedagogical criteria towards the biomechanical ones. This is why biomechanical criteria are used for dividing gymnastics elements into parts. Thus, the technical structure of gymnastics elements contains three levels – *periods, stages and phases* (Suchilin, 2010).

The beam, a specific event of women's artistic gymnastics, can be characterized as a balance apparatus par excellence both physically and mentally. From a biomechanical point of view, the mastery and adjustment of balance throughout the exercises on the beam can be achieved by respecting the logical principle of the permanent projection of the center of gravity of the body on the narrow supporting surface. In conformity with the international regulations, the routine on the beam must

include a mount, elements of different structural groups (acrobatic, gymnastic, mixed elements) and elements near the balance beam. The whole combination must be characterized by dynamism, changes of rhythm and continuity. The end of the exercise (the dismount) must be consistent with the difficulty of the whole and with the specific requirements of the competition. The dismount off the beam is also a very important moment of each exercise, because the last impression depends on it (Vieru, 1997).

The artistic performance on the beam is acknowledged when the gymnast demonstrates her abilities to transform the routine from a well-structured composition into a performance consisting of a "whole" that gathers creativity, confidence, personal style and perfect technique (***, 2013).

The location of the support segments or, in other words, the location of the arms and feet on the apparatus, is an important technical element of the movements on the beam. Various exercises, of course, require various supports. Taking into account a work order with the soles in longitudinal standing position, we can point out the symmetrical and asymmetrical position of the feet. The technical rules highlight that the own power is maintained during support on feet, but also during support on hands. There are also several variants of putting the hands on the beam, some of them used for the execution of many static and dynamic exercises - symmetrical position; but the asymmetrical position too enables a good position on the apparatus (Gaverdovskij, 2002).

Regarding the biomechanical particulars and features on the beam, there are some moments that should be highlighted: the role of posture and muscle tone to maintain the balance – one of the main conditions of the gymnast's rational working posture, especially from the standing up position, from which the major part of the elements on the beam are performed; the technical elements with static balance and the technical elements with dynamic balance (Smolevskij & Gaverdovskij, 1999).

As for the pushes from the standing - start position, these are performed in the "support – athletic system", presenting complex biomechanical features of motor movement, where the technical details are introduced by many specialists throughout the training and improvement process. In the case of the beam, the push is a little more complex because it involves displacement and rotation at the same time, specific to acrobatic elements (Gaverdovskij, 2007).

Biomechanical research in artistic gymnastics can be performed using both biomechanical methods and methods taken from other fields of knowledge (pedagogical, mechanical, physiological, psychological, medical, etc.), mainly intended to highlight the features of movement on various apparatus by selecting the data recording, processing and analysis means (Potop, 2007).

Numerous studies are scientifically applied for understanding and classifying movement in gymnastics from a biomechanical point of view, based on a clear establishment of the study field. The most recent classification of movements in gymnastics was made by

Bruggmann (1994) and taken over from Hochmuth & Marthold 1987, quoted by Crețu et al., 2004; this divides gymnastics movements into the following categories:

a) releases and repulsions from solid and elastic surfaces – floor, vaults, balance beam, parallel bars, uneven bars, high bar;

b) vertical revolutions around a fixed or movable axis located in horizontal plane – high bar, uneven bars, still rings;

c) horizontal revolutions around a vertical axis – circular motions on the pommel horse, parallel bars and floor;

d) free flight revolutions – floor, simple and double vaults, twisting vaults, elements of release and grip of the high bar and uneven bars: dismounts off the high bar, uneven bars and still rings;

e) landings – dismounts off all apparatus and difficult elements on the floor and balance beam.

In the case of the balance beam, current concerns in the scientific research on biomechanical aspects have been expressed by Brown, Witten, Espinoza (1995) (quoted by Crețu et al., 2004), referring to the reaction force and simple dismounts, while the biomechanics of acrobatics on the beam and on floor in terms of the optimal angle and velocity of the flip and also, the angular momentum in somersaults is studied by Knoll (1996) (quoted by Crețu et al., 2004).

The aim of the paper is the biomechanical analysis of the acrobatic elements on the beam at the level of junior gymnasts 12 to 14 years old.

Hypothesis

We believe that the computerized video biomechanical analysis of the acrobatic elements on the beam in the case of the 12 to 14-year-old female gymnasts will contribute to the establishment of the technical training level in accordance with the specific penalties on apparatus and the performance achieved in competitions.

Material and methods

An experimental study was conducted in the Deva junior team, applied to a group of 8 female gymnasts, aged 12 to 14 years. This research used the video biomechanical analysis method, monitoring the key components of sports technique of the acrobatic elements on the beam; statistical processing was performed using the Microsoft Office Excel 2003 method. The study was conducted during the period of the Masters National Championships of Onești 2012, in which the gymnasts' routines on the beam in the all-around event and the finals on this apparatus were monitored and recorded.

Research protocol

a) Period and place of the research

The research was conducted from 16th November to 18th November 2012 throughout the Masters National Championships, at the Sports Hall of Onești.

b) Subjects and groups

In order to emphasize the biomechanical features of the key acrobatic elements on the beam, we monitored the contents of the routines performed by the 12 to 14-year-

old junior gymnasts during the finals on the beam. Eight junior gymnasts aged 12-14 years, members of the Deva junior team, participated in this study.

c) Tests applied

The positions and movement orientation were presented and studied in the structure of the acrobatic elements (Boloban, 1990; Sadovski et al., 2009): *start position, body position multiplication and final position*.

For highlighting the kinematic and dynamic characteristics of the key components of sports technique in the case of the acrobatic elements on the beam, we analyzed – by means of the specialized program called Physical ToolKit (***, 2011) – the execution of the acrobatic elements by the 12-14-year-old juniors; these elements were shown in different ways: *separated, connected and mixed*.

In order to perform the video biomechanical analysis, it was necessary to test the anthropometric measurements (hands up height, for calculating rotational inertia; identification of biomechanical parameters for each technical element by the program; establishment of the spatial reference points for analysis (height of the balance beam and origin of each analyzed movement), calibration of video frames depending on the technical structure of the movement.

d) Statistical processing

Statistical processing in this research was performed using Microsoft Office Excel 2003, in terms of mean - arithmetic mean, SEM - standard error of the mean, SD - standard deviation, t-SRC - Spearman Rank Correlation.

Results

Table I shows the anthropometric data of 12-14-year-old junior gymnasts and the parameters of biomechanical video analysis during the execution of the separated acrobatic elements on the beam, of 2-3 connected elements and of mixed elements (gymnastic and acrobatic).

Table no. II introduces the kinematic features of the body segment trajectories of gymnast IA, in terms of video sequences – number of frames, movement duration, key elements of sports technique (SP - start position, MP - multiplication of position - flight phase and FP - final position - landing).

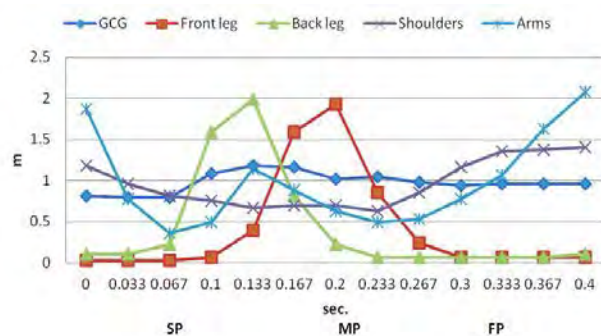


Fig. 1 – Trajectories of body segments during Free (aerial) cartwheel execution – vertical movement (IA).

Legend: GCG-general center of gravity (hip); FL-front leg, BL-back leg, S-shoulders, A-arms.

Figure no. 1 shows the trajectories of the body segments during the performance of Free (aerial) cartwheel - vertical movement (Ym), evidencing the time and the key elements of the execution technique.

Table III shows the results of GCG force and angular velocity in the relationship of GCG with the front leg, back, shoulder and arms (Figures 2 and 3).

Table no. IV shows the results of the performances achieved on the beam in competition, in terms of difficulty, execution, final score and ranking in the finals on apparatus.

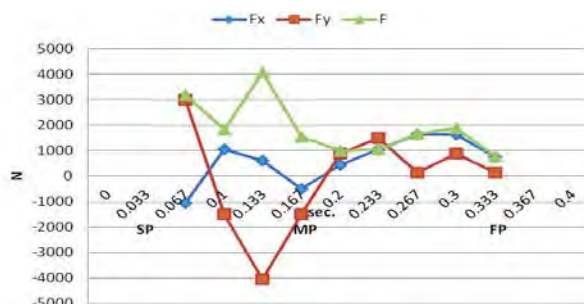


Fig. 2 – Results of GCG force (hip) during execution of Free (aerial) cartwheel - (IA).
Legend: N - Newton.

Table I
Anthropometric data and parameters of biomechanical video analysis of 12-14-year-old gymnasts during performance of acrobatic elements on the beam.

No.	FN	Height (m)	Weight (kg)	Elements			IR kgm ²	CVI (frame)	RM / GCG (m)			
				Separated	CAE	Mixed			Front leg	Back leg	Shoulders	Arms
1	V.C.	1.49	36.6	FWF	FF-SBP	SL-SBT	5	0.897	0.858	0.491	0.654	
							5	0.984	0.958	0.561	0.919	
							3	0.965	0.98	0.525	0.452	
2	S.S.	1.52	40.4	SFT	FF-SBT	SL-SST	5	0.904	0.883	0.485	0.726	
							3	0.78	0.745	0.559	0.675	
							5	0.955	0.937	0.52	0.813	
3	T.P.	1.53	38.5	FWF	FC-SBSSO	SL-SST	7	0.92	0.913	0.521	0.874	
							3	1.089	0.994	0.567	0.749	
							-	-	-	-	-	
4	R.M.	1.44	36.9	FWF	FF-SBSSO		3	0.982	1.023	0.552	0.921	
							3	0.935	0.911	0.474	0.689	
							-	-	-	-	-	
5	D.D.	1.47	34.0	FWF	FF-SBP		3	0.818	0.788	0.506	0.793	
							3	0.915	0.896	0.542	0.784	
							-	-	-	-	-	
6	Z.S.	1.45	31.5	FWF	FF-SBP		3	0.84	0.851	0.508	0.757	
							3	0.912	0.93	0.514	0.759	
							5	0.963	1.00	0.572	0.903	
7	B.A.	1.48	34.1	FWF	JB180°WF-FF-SBSSO	SL-FC	7	0.958	0.984	0.561	0.919	
							3	0.974	0.931	0.541	0.773	
							5	0.872	0.838	0.456	0.695	
8	I.A.	1.38	32.1	FC	FWF-FF-SBT	SL-SBSSO	5	0.763	0.764	0.493	0.537	
							3	0.915	0.868	0.507	0.746	
							-	-	-	-	-	
Mean		1.47	35.5				77.09	4.14	0.915	0.90	0.52	0.76
SEM		0.02	1.10				3.87	0.29	0.02	0.02	0.01	0.03
SD		0.05	3.12				10.9	1.35	0.07	0.08	0.03	0.12

Legend: FN - full name; CAE - connected acrobatic elements; IR - inertia of rotation; RM - radius of movement; CVI - calibration of video image (frame); GCG (hip) - general center of gravity; SL-SST - witch Leap - Salto swd taked; SL-FAC - Switch Leap - Free (aerial) cartwheel; SL-SBS - Switch Leap - Salto bwd stretched - step out; SFT - Salto fwd tucked to cross stad; FC - Free (aerial) cartwheel; FWF - Free (aerial) walkover fwd; FF-SBP - Flic-flac with step out - Salto bwd piked; FF-SBT - Flic-flac with step out - salto bwd tucked; FC-SBSSO - Free (aerial) cartwheel - salto bwd stretched step out; JB180°WF-FF-SBSSO - Jump bwr (flic-flac take-off) with ½ twist (180°) through hand to walkover fwd - Flic-flac with step out - salto bwd stretched step out; FWF-FF-SBT - Free (aerial) walkover fwd - Flic-flac with step out - salto bwd tucked; SEM - standard error of the mean; SD - standard deviation.

Table II
Results of body segments trajectories during the execution of Free (aerial) cartwheel (IA).

VS (Fr.)	Time (sec.)	KE	CGG (m)		Front leg (m)		Back leg (m)		Shoulders (m)		Arms (m)	
			x	y	x	y	x	y	x	y	x	y
1	0.00	SP	0.73	0.81	0.04	0.02	0.99	0.10	0.39	1.18	0.49	1.87
2	0.033		0.57	0.79	0.04	0.02	0.99	0.10	0.08	0.96	-0.31	0.77
3	0.067		0.41	0.79	0.06	0.02	1.02	0.22	-0.24	0.81	-0.33	0.35
4	0.1	MP	0.10	1.08	0.08	0.06	0.61	1.59	-0.31	0.75	0.00	0.49
5	0.133		-0.06	1.18	0.43	0.39	-0.35	1.99	-0.18	0.67	-0.35	1.14
6	0.167		-0.22	1.16	0.55	1.59	-1.12	0.81	-0.26	0.69	-0.55	0.88
7	0.2		-0.45	1.02	-0.35	1.93	-0.79	0.22	-0.26	0.69	0.12	0.63
8	0.233		-0.61	1.04	-1.46	0.85	-0.69	0.06	-0.24	0.63	-0.63	0.49
9	0.267		-0.77	0.98	-1.18	0.24	-0.69	0.06	-0.28	0.85	-0.49	0.53
10	0.3		-0.85	0.94	-0.99	0.06	-0.69	0.06	-0.45	1.16	-0.10	0.77
11	0.333	-0.87	0.96	-0.99	0.06	-0.69	0.06	-0.51	1.36	-0.08	1.06	
12	0.367	FP	-0.87	0.96	-0.99	0.06	-0.69	0.06	-0.63	1.38	-0.12	1.63
13	0.4		-0.87	0.96	-0.99	0.06	-0.83	0.10	-0.71	1.40	-0.39	2.08

Note: x - horizontal movement, y - vertical movement; SP - start position; MP - multiplication of position (flight phase); FP - final position (landing); KE - key element.



Fig. 3 – Results of angular velocity of body segments during execution of Free (aerial) cartwheel.
Legend: PF - front leg; PS - back leg.

Table IV

Performances achieved in competition on the beam (n=8).

FN	All-around finals			Apparatus	
	D	E	FS	Result	Rank
V.C.	5.300	8.275	13.575	12.750	8
S.S.	5.600	8.525	14.125	14.535	3
T.P.	5.500	8.700	14.200	13.350	6
R.M.	5.200	8.600	13.800	13.950	4
D.D.	5.200	8.925	14.125	12.935	7
Z.S.	5.700	8.650	14.350	13.885	5
B.A.	5.700	9.125	14.825	14.600	2
I.A.	5.800	8.050	13.850	15.050	1
Mean	5.500	8.61	14.11	13.88	
SEM	0.08	0.12	0.13	0.29	
SD	0.24	0.34	0.38	0.82	
t - SRC			0.69	p>0.05	
Probability			0.48		

Note: Mean - arithmetic mean, SEM - standard error of mean, SD - standard deviation, t-SRC - Spearman Rank Correlation; FN - full name, D - difficulty; E - execution, FS - final score, Rank - ranking.

Discussion

The biomechanical analysis of the acrobatic elements on the beam was performed using the Physics ToolKit program, on a group of 8 finalist gymnasts on this apparatus. The study was conducted during the Masters National Championships of Onești 2012.

Regarding the content of the routine on the beam for the difficulty value (DV), a maximum number of 8 elements with the highest value were taken into consideration, including the dismount: *maximum 5 acrobatic elements and minimum 3 gymnastic elements*. For the composition

requirements, with all amendments performed, the gymnast received 2.5 points, consisting of: 1) one connection of minimum 2 different gymnastic elements out of which 1 hop with legs in 180° split (transversally or laterally) or sideward pike opening; 2) pirouette; 3) an acrobatic series of minimum 2 elements with flight phase out of which 1 somersault (the elements can be identical); 4) acrobatic elements in different directions: forward/sideward and backward and 5) dismount (***, 2013).

The study results highlight the biomechanical analysis of the key components of sports technique (according to Boloban, 1990), especially the execution of the acrobatic element Free (aerial) cartwheel, in terms of start position (SP), multiplication of position – momentum of maximum height of GCG (MP) and final position – landing.

Regarding the parameters of the biomechanical analysis of acrobatic skills on the beam, we notice a mean of 1.47 m for the gymnasts’ height and 35.5 kg for body mass. The following elements were analyzed: 8 acrobatic elements performed separately, 8 connections of 2-3 acrobatic elements and 5 mixed series (gymnastic - acrobatic), having a mean rotational inertia of 77.09 kgm² and a mean movement radius of front leg toe segments of 0.915 m, 0.90 m for back leg toes (putting the foot on the beam), 0.52 m for the mean of the shoulders and 0.76 m for the mean of the arms (Table I).

During this study, we carried out a video biomechanical analysis of the acrobatic element, Free (aerial) cartwheel - landing in cross or side position on one or both feet; element of difficulty D -0.4 points – specific composition requirement on the beam.

The video biomechanical analysis highlights the key elements of sports technique specific to the acrobatic element Free (aerial) cartwheel in terms of start position by bending the torso forward, pushing from the front leg and rotation of the arms forward till reaching the maximum height momentum of GCG (first phase), followed by the 2nd phase, with 180° turn and continuing by overturning the back leg (swing), till landing on the opposite side (revolution around the hip) - raising the torso while the front leg touches the beam and the arms are rotated and raised upward in the final position – lunge landing.

In terms of trajectories of the body segments during the execution of Free (aerial) cartwheel element, there

Table III

Results of biomechanical analysis - Free (aerial) cartwheel (IA).

VS (Fr.)	Time (sec.)	KE	GCG (N)			Front leg (rad/s)	Back leg (rad/s)	Shoulders(rad/s)	Arms(rad/s)
			Fx	Fy	F				
1	0.00	PP							
2	0.033					4.49	7.03	11.86	28.68
3	0.067		-1050	3000	3180	8.79	27.32	15.09	20.86
4	0.1		1050	-1500	1830	14.73	40.28	20.70	-6.16
5	0.133	MP	599.53	-4050	4090	31.57	40.32	12.26	-10.32
6	0.167		-499.64	-1500	1560	37.57	35.3	11.33	28.67
7	0.2		449.64	899.29	1010	33.39	16.95	12.42	4.59
8	0.233		1050	1490	1060	31.84	7.57	12.33	-6.18
9	0.267		1650	149.88	1660	18.16	4.05	20.32	21.14
10	0.3		1650	899.28	1880	5.63	1.71	16.41	17.15
11	0.333		749.41	149.88	764.25	0.39	0.27	8.32	14.26
12	0.367					0.00	-2.34	5.82	15.63
13	0.4	PF							

Note: VS-video sequence (frame), KE-key element of movement; Fx-horizontal force; Fy-vertical force; F-resultant of force, N-Newton.

is a maximum height of the GCG of 1.18 m and torso bending with the shoulder at 0.67 m height, which ensures legs rotation around the hip and torso raising in the final position (landing).

Concerning the force at GCG level, we notice that the momentum of maximum height on F_y is -4050 N, while the highest values are recorded in vertical direction (Y_m), which contributes to the performance of somersault rotation with legs apart by a pushing and balancing movement.

As for the results of the angular speed of the body segments involved in the execution of the acrobatic element Free (aerial) cartwheel, we can observe, in the start position by torso bending, a value of 11.86 rad/s, front leg for pushing - 4.49 rad/s, back leg for balance - 7.03 rad/s and arms rotation - 28.68 rad/s – what matters the most is the arms' work, the pushing and the balance of the back leg in the phase of position multiplication at the momentum of the maximum height of the GCG [t-1.333sec.]- the front leg has a value of 31.57 rad/s, the back leg – 40.32 rad/s, shoulders – 12.26 rad/s and arms – 10.32 rad/s; in the phase of the final position [t-0.367sec], before landing fixation, the angular velocity values are the following: the balance leg moves for counterbalancing the position – (-2.34 rad./s), the velocity of torso raising decreases up to - 5.82 rad/s, while the raising of the arms – 15.63 rad/s.

Regarding the performances achieved during the Masters National Championship, all the 8 gymnasts who participated in the all-around event were qualified in the finals on apparatus (all these gymnasts were members of the junior team that used to train in Deva; at the present moment they are training in the Olympic National Center of Izvorani).

In terms of the content of the routines on the beam, all gymnasts performed all the amendments of the requirements for the junior class 12 to 14 years old, having a mean difficulty score of 5.500 points (minimum value 5.200 points and maximum value 5.800 points); the mean score for execution was 8.61 points (minimum value 8.275 points and maximum value 9.125 points) and the mean final score was 14.11 points.

Concerning the results achieved in the finals of the beam event, if we compare them with the results of the all-around event, we notice a diminution of the score for execution and of the final score by 0.23 points. The coefficient of correlation between the two competitions shows insignificant values $t=0.69$ at $p>0.05$, which does not confirm the influence of the means of the performances between competitions and a poorer performance in the finals on apparatus. However, there are also individual values evidencing an improvement of performance in the finals of the beam event: for example, athlete IA ranked the first starting from the 5th place.

Conclusions

The parameters of the biomechanical analysis of acrobatic skills on the beam emphasize the gymnasts' height, body mass, the analysis of the acrobatic elements executed separately, or in a connection of 2-3 acrobatic elements or in mixed series (gymnastics - acrobatic), the

mean rotational inertia, the mean movement radius of the segments: front leg toes (for pushing), back leg toes (for balance), shoulders and arms.

The video biomechanical analysis of the acrobatic element Free (aerial) cartwheel highlights the spatial-temporal kinematic features regarding the trajectories of the body segments involved in movement (x , y , R), key-components of sports technique, characteristics of translation movement with revolution around the axis of the body (hip – GCG), features of the angular velocity of the body segments related to GCG and the dynamic features regarding GCG (F_x , F_y and F).

The results of the performances obtained during the Masters National Championship evidence the achievement of the requirements of junior class 12 to 14 years old on the beam, the mean difficulty scores, the diminution of the score for execution and the final mean in the apparatus finals and the improvement of individual performances.

The video biomechanical analysis of the acrobatic elements on the beam emphasizes the kinematic and dynamic characteristics of the key components of sports technique and the influence exerted by these on the performance achieved in competition, which confirms the suggested hypothesis.

Conflicts of interest

There are no conflicts of interests.

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Neurolinguistic programming techniques in sports training for enhancing performance capacity

Tehnicile de programare neuro-lingvistică în antrenamentul sportiv pentru creșterea capacității de performanță

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Abstract

Background. In this study, we wish to emphasize the importance of communication between coaches and athletes in order to increase athletic performance. If we compare communication to the analog/digital transmission mode, in the past communication was analogical, while at present it is digital – through submodalities of the communication channel. The language of training is more dynamic and is accompanied by a number of mentions based on senses and on the description of the motor act.

Aims. To find the favorite communication channel of each athlete. Verbs of action, motion, processes, etc. establish reality more clearly. Neurolinguistic programming has a real arsenal of effective techniques capable of generating rapid changes in the athlete's performance, in increasing performance capacity. Neurolinguistic programming uses ideomotor representations, accompanied by visual, auditory, kinesthetic, tactile, olfactory sensations felt by the athlete to describe certain movements.

Methods. Applying a questionnaire by the authors Bandler & Thomson, Garner & Jacobson to the Olympic judo team of Romania. The questionnaire items were classified into three categories: visual, auditory and kinesthetic. The written answers of the athletes allowed to analyze the submodal distinctions of communication and to determine the main communication channel of each athlete.

Results. Neurolinguistic programming techniques applied in practice reveal significant differences for auditory sensations in influencing athletic performance $p=0.652$. There is a significant positive correlation between visual sensations and kinesthetic sensations ($r=0.59$, $df = 23$, $p<0.01$). There is no significant correlation between kinesthetic sensations and olfactory and gustatory sensations. Subjects undergoing a stimulation of visual and auditory channels will have positive effects in the kinesthetic area.

Conclusions. It is very important for the technical staff to understand the best way to communicate with each athlete by applying neurolinguistic programming techniques, so that athletes can reach optimal results in major national and international competitions.

Key words: ideomotor representation, sports training, NLP, sensations: auditory, visual, kinesthetic.

Rezumat

Premize. În acest studiu dorim să subliniem importanța comunicării dintre antrenori și sportivi în vederea creșterii performanțelor sportive. Dacă comparăm comunicarea cu modul de transmisie analogic/digital, în trecut comunicarea se realiza în mod analogic, iar în prezent se realizează în mod digital – prin submodalități ale canalului de comunicare. Limbajul este mai dinamic și este însoțit de o serie de specificări bazate pe simțuri și pe descrierea actului motric.

Obiective. Găsirea canalului de comunicare favorit al fiecărui sportiv. Verbele de acțiune, mișcare, procese, etc. stabilesc realitatea într-un mod mai clar. Programarea neuro-lingvistică are un adevărat arsenal de tehnici eficiente, capabile să genereze schimbări rapide în performanța sportivului, în creșterea capacității de performanță. Programarea neuro-lingvistică folosește reprezentări ideomotorii, însoțite de senzații vizuale, auditive, kinestezice, tactile, olfactive, simțite de sportive pentru a descrie anumite mișcări.

Metode. Aplicarea unui chestionar al autorilor Bandler & Thomson, Garner & Jacobson, la Lotul Olimpic de judo al României. Itemii din chestionare au fost clasificați în 3 categorii: vizual, auditiv și kinestezic. Prin răspunsurile date în scris de sportive se realizează analiza distincțiilor submodale de comunicare și se poate determina care este canalul principal de comunicare al fiecărei sportive.

Rezultate. Tehnicile programării neuro-lingvistice, aplicate în antrenament, prezintă diferențe semnificative în cazul senzațiilor auditive în influențarea performanțelor sportive $p=0,652$; există o corelație pozitiv semnificativă între senzațiile vizuale și senzațiile kinestezice ($r=0,59$, $df=23$, $p<0,01$); nu prezintă corelație semnificativă între senzațiile kinestezice și senzațiile olfactive și gustative. Subiecții cărora li se stimulează canalele vizuale și auditive vor avea efecte pozitive și în sfera kinestezică.

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Concluzii. Pentru staff-ul tehnic este foarte important să înțeleagă care este modalitatea optimă de comunicare cu fiecare sportivă, prin aplicarea tehnicilor programării neuro-lingvistice, în așa fel încât sportivele să ajungă la rezultate optime la marile concursuri naționale și internaționale.

Cuvinte cheie: reprezentare ideomotorie, antrenament sportiv, programare neuro-lingvistică, senzații: auditive, vizuale, kinestezice.

Introduction

Neurolinguistic programming (NLP) abounds in behavior changing techniques, which are rapidly adapted to the specific case of sports activity. NLP is aimed at optimizing cognitive-behavioral modalities that are frequently a short-term objective. Neurolinguistic programming (NLP) has a real arsenal of effective techniques, capable of generating rapid changes in athletic performance and of creating a favorable behavior (Grosu, 2012). "Neuro relates to what is happening in your mind. Linguistic refers not only to the words you use in your communication, but also your body language and how you use it. Programming tackles to persistent patterns of behavior that you learn and than you repeat". (Ready Romilla & Burton Kate, 2010)

Subconscious, conscious, wish, imagination, body structure, relationship dynamics... all are a sort of interface between the way in which we relate to the others, how we would like to be ourselves, and the way in which we will eventually achieve self-fulfillment (Hall, M., 1996).

These sensations are certainly influenced by the senses. Language reflects these relationships naturally, when people express it (Jacobson, 2009).

The general picture of neurolinguistic programming (NLP) consists of using the nervous system in order to create a model that creates in its turn the sense of reality. Our nervous system – the brain – receives information from the environment by means of the senses. We use these understanding modalities to create sensor information ("thoughts") and to store it ("memory"). NLP defines these methods of working with the subjects, *ideomotor representations*, systems of actions, based on sensations such as: visual, auditory, kinesthetic, tactile, olfactory. Each system has its own list of sensory submodalities (Bodenhamer BG, Hall M, 2012). Modeled training is based on the principle of training for a specific sport (Epuran, 2008).

Hypotheses

Using neurolinguistic programming techniques, the research is aimed at increasing the performance capacity of the female athletes of the Olympic judo team. These techniques have been very little applied to the sports science area. Educating at school or in sport is a profession full of interaction with not only instructing, but also influencing and sometimes guiding (Isidori, Emanuele, 2009).

Finding the favorite communication channel of each athlete. Verbs of action, motion, processes, etc. establish reality more clearly. In the initial phase of starting to exercise, cognitive processes in the form of attributions and self-efficacy may be special important influences on psychological well-being (Biddle Stuart J.H.; Fox, Kenneth R.; Boutcher, Stephen H, 2000).

Neurolinguistic programming (NLP) has a real arsenal of effective techniques, capable of generating

rapid changes in athletic performance, in increasing performance capacity. Neurolinguistic programming (NLP) uses ideomotor representations accompanied by visual, auditory, kinesthetic, tactile, olfactory sensations felt by athletes in order to describe certain movements.

Material and methods

Research protocol

a) *Period of the research*

This paper is part of a larger study aimed at optimizing judo training. The experiment was conducted in the period October-December 2012 in Cluj-Napoca.

b) *Subjects and groups*

The subjects of the experiment were female athletes of the Olympic judo team of Romania, divided into 4 groups: children (12-13 years), cadets (14-16 years), juniors (17-19 years), seniors (older than 20 years). The questionnaire was applied to 25 athletes.

The athletes were asked to think and imagine that they executed the back techniques: uchi-mata, harai-goshi and koshi-guruma. The athletes had to think of the execution technique and focus on the general phases of the technique: kuzushi (unbalancing), uchi-komi (technique entrance), nage-komi (throwing). It is important that the ideomotor representations of the above mentioned motor acts should be paralleled by the sensations accompanying the execution of those motor acts.

c) *Tests applied*

The research methods used were: statistical analysis and investigation performed by applying the questionnaire "The Secret of Being Happy", in English, or "NLP per il benessere", the Italian edition (Bandler & Thomson, 2011; Garner & Jacobson, 2009).

The items were classified into 3 categories: visual, auditory and kinesthetic (VAK), according to Dilts et al., 2011. The written answers of the athletes allowed to analyze the submodal distinctions of communication and to determine the main communication channel between the coach and the athletes (for each individually). At this point, it can be said that the alteration of a communication submodality may have a strong effect on another submodality, in the sense of its increase or decrease. For example, if the brightness of an image increases, the intensity of the sensations determined by it in our mind might also increase. Qualitative or quantitative changes may take place.

d) *Statistical processing*

Statistical processing was performed using the SPSS 15.0 software. For the comparison of the means between the subject groups, the ANOVA test was used and for multiple comparison, the post-hoc Bonferroni test. The correlation between the variables was established with the Pearson correlation coefficient (r). The diagrams were drawn using the box plot method and they indicated: the

minimum and maximum value, the median, percentiles 75 and 25; extreme scores.

We mention that the approval of the Ethics Board of the Olympic Judo Team as well as the informed consent of the participants in the research and their parents were obtained.

Results

The content of submodal distinctions refers to several components. Here is a list of the main visual submodalities, followed by a brief description of each and some instructions on what can be changed: brightness, acuity, distance, static image, size, moving image, shape, associated, position, dissociated, direction, three-dimensional depth, contrast, flat image, clarity, framed/unframed, color, other quality. In most of the cases, the difficulty encountered in understanding these types of differences is related to the limits within which we use our language (not to the limits of our sensory experience) (Jacobson, 2009). Color indicates the number of colors that are seen, the image is black and white or colored, or a combination of the two. There are colors that are conspicuous, as if they were central or more important. The following indications were given to the athletes: an image may be focused but not clear, or it can be very accurately exposed or it may have certain diffuse parts. The shape defines the configuration of an image, but also the potential shapes that are seen inside the image. The same may be true for size, distance and position, it is a sort of game of the mind (Bandler & Fitzpatrick, 2011).

The athletes were told the following: "When you are associated to the image, you see exactly with your eyes as if you were there (usually a panoramic image). In other words, you do not see yourselves inside the image. When you are dissociated from the image, the opposite happens, you see yourselves in the image as if someone else's eyes saw the image, as if you watched a movie. The analysis of submodal distinctions through the visual, auditory and kinesthetic channels in the athletes of the judo groups (Bandler & Thomson, 2011) can be seen in Table I and Fig. 1.

Discussion

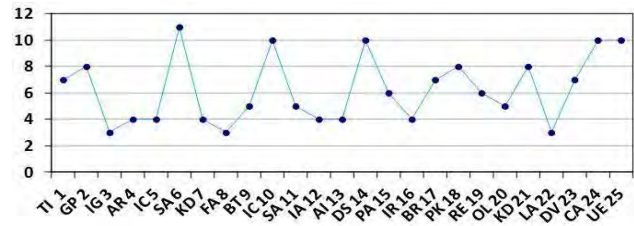


Fig. 1 – Analysis of visual submodalities.

On the abscissa, the 25 subjects are represented, and on the ordinate, the values of the visual components.

The values of the visual submodality distinctions can be seen in Fig. 2. In the children category, there is an athlete who has visual preferences with the value 8. In the cadet group, there are 3 athletes with values of the visual components higher than 10, which represent the largest group. In the junior group, the maximum value is 8, with only one athlete who prefers visual communication during training. In the senior group, 3 of 5 athletes prefer visual submodalities, with values higher than 8.

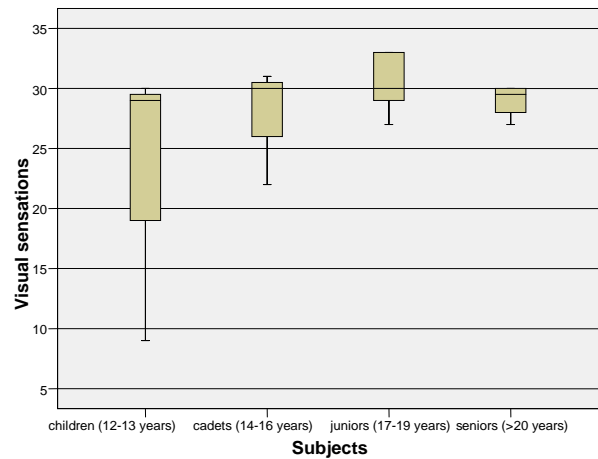


Fig. 2 – Box plot diagrams – visual sensations.

Table I
Analysis of visual submodality distinctions in the Olympic judo team.

Indicator	Age																								
	12-13 years Children			14-16 years Cadets										17-19 years Juniors					Over 20 years Seniors						
Group	TI	GP	IG	AR	IC	SA	KD	FA	BT	IC	SA	IA	AI	DS	PA	IR	BR	PK	RE	OL	KD	LA	DV	CA	UE
Subjects	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Visual channel	7	8	3	4	4	11	4	3	5	11	5	4	4	10	6	4	7	8	6	5	8	3	7	10	10

Table II
Analysis of auditory submodalities in the Olympic judo team.

Indicator	Age																								
	12-13 years Children			14-16 years Cadets										17-19 years Juniors					Over 20 years Seniors						
Group	TI	GP	IG	AR	IC	SA	KD	FA	BT	IC	SA	IA	AI	DS	PA	IR	BR	PK	RE	OL	KD	LA	DV	CA	UE
Subjects	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Acoustic channel	3	2	3	3	2	3	2	2	3	7	2	4	3	3	4	4	3	4	3	2	2	1	2	5	6

The auditory submodality distinctions of sounds are more important than volume, particularly regarding voices. The voice characteristic of a person, which is technically termed vocal timbre, might have an impact on us more than anything (Jacobson, 2009). The auditory submodalities were described (Bandler & Thomson, 2011): sounds, vocal timbre, words, internal, position, external, frequency, direction, tone, tempo, voice, volume, distance, duration, rhythm (Table II).

The athletes were given indications: whether the sounds come from inside or outside the body might be more important to note, identifying an exact position. The direction from which they come will be relevant. Volume might be influenced by distance and direction, usually sounds seem fainter when they are far away and volume is louder when they are closer (Jacobson, 2009). There are other qualities of the sound that are important. In order to distinguish them clearly, it is useful to think in musical terms. A characteristic is frequency, the higher or lower notes played by a piano, or rhythm and tempo. Even duration can be important, in certain cases. Tone and timbre refer to the frequency range and the distribution of the sound.

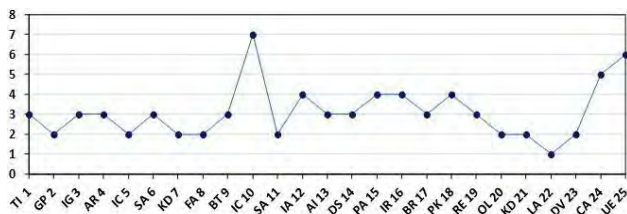


Fig. 3 – Analysis of auditory submodalities.

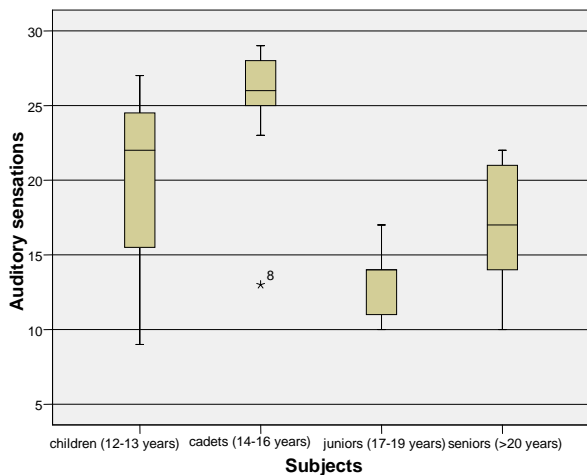


Fig. 4 – Box plot diagrams – auditory sensations.

On the abscissa, the 25 subjects are represented, and on the ordinate, the values of the auditory components (Fig. 3). Regarding data interpretation, it can be said that athletes at this stage of the experiment do not use auditory submodal distinctions in the training process. There is only one athlete in the cadet category (14-16 years) who uses auditory submodalities with the value 7. In the future, this aspect should be worked on, in order to develop the ideomotor representations of motor acts, of technical elements during training (Fig. 4).

The analysis of data by kinesthetic submodalities shows that 2 athletes, one in the cadet group and the other in the children group, use in the case of ideomotor representations certain kinesthetic sensations, with the values 9 and 10 (Table III, Fig. 5).

Kinesthetic submodal distinctions: internal, proprioceptive sensation, external, shape, position, temperature, weight, movement, duration, intensity, size, humidity, pressure, consistence, frequency, rhythm, tactile sensation, balance.

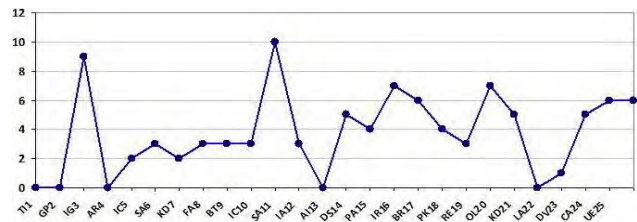


Fig. 5 – Analysis of kinesthetic submodalities.

On the abscissa, the 25 subjects are represented, and on the ordinate, the values of kinesthetic components.

In the future, it remains to work on these submodal distinctions during training, so that athletes can better feel any movement (motor act), see Figs. 5 and 6.

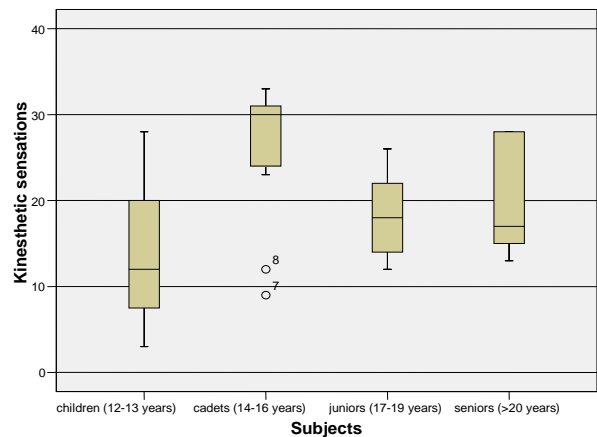


Fig. 6 – Box plot diagrams – kinesthetic sensations.

Table III
Analysis of kinesthetic submodalities in the Olympic judo team.

Indicator	Age																								
	12-13 years Children			14-16 years Cadets							17-19 years Juniors					Over 20 years Seniors									
Group	TI	GP	IG	AR	IC	SA	KD	FA	BT	IC	SA	IA	AI	DS	PA	IR	BR	PK	RE	OL	KD	LA	DV	CA	UE
Subjects	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Kinesthetic channel	0	9	0	2	3	2	3	3	3	10	3	0	5	4	7	6	4	3	7	5	0	1	5	6	6

The table below contains: the partial means for each perception submodality as part of neurolinguistic programming: visual, auditory, kinesthetic, olfactory, gustatory by different age categories, Table IV. Much educational research is concerned with establishing interrelationships among variables (Cohen Luis; Manion Lawrence; Morrison Keith, Research Methods in Education, 2007).

Table IV
Analysis of NLP submodalities (means by age categories) in the Olympic judo team.

Indicator	Category			
	12-13 years Children	14-16 years Cadets	17-19 years Juniors	Over 20 years Seniors
Subjects	3	11	5	6
Visual	22.6	28	30.4	29
Auditory	19.3	25.3	13.2	16.8
Kinesthetic	14.3	25.5	18.4	19.6
Olfactory-gustatory	5	1.54	9.6	4.8

In the case of kinesthetic submodalities, the following sensations listed below can be identified or not by the athletes. The athletes were suggested to think of the tactile, proprioceptive and vestibular sensations that they felt during the ideomotor representations of the various technical elements as follows: tactile sensation means the sensation of contact at the surface of the skin (temperature, consistence, humidity, physical contact); proprioceptive sensation – a sensation from inside the body, internal pressure, tension, weight, position of the body and limbs; vestibular sensation – the sense of balance (position in space, gravity-dependent relationships); a strong emotion includes elements of all these types and something more. We might have similar physical sensations in very different situations and give them different names. If we wish to feel a sensation, it means that we like it, and in the opposite case, we feel it as unpleasant. The same physiological sensation is interpreted differently.

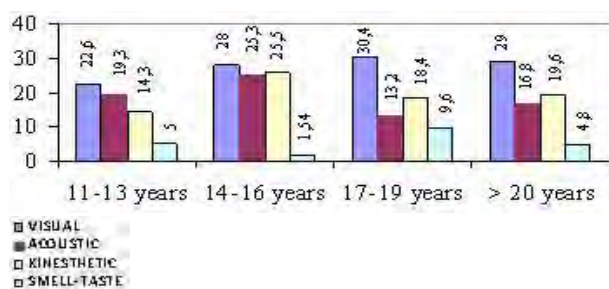


Fig. 7 – Analysis of perception submodalities.

The components of visual, auditory, kinesthetic, olfactory and gustatory submodalities were selected according to an operational scheme proposed by Jacobson (2009). Until recently, only the presence or the absence of different sensations felt during the execution of motor acts, the analogic type, were taken into consideration, as shown in the first part of the study. The values recorded in Fig. 7 refer to each category of sensations by age groups. It can be seen that in all age groups, kinesthetic sensations

need to be worked on in order to reach the values of visual sensations.

Today, in the analysis of sensations felt during ideomotor representations, the different submodalities of each sensation, the digital type, are considered. For example, brightness and its value, which can be different for each athlete, are important. Size, shape, distance and all the other visual submodal distinctions can also be felt and interpreted differently by each of our athletes. The same is true for all the other components of auditory, kinesthetic, olfactory-gustatory submodalities (Fig. 8).

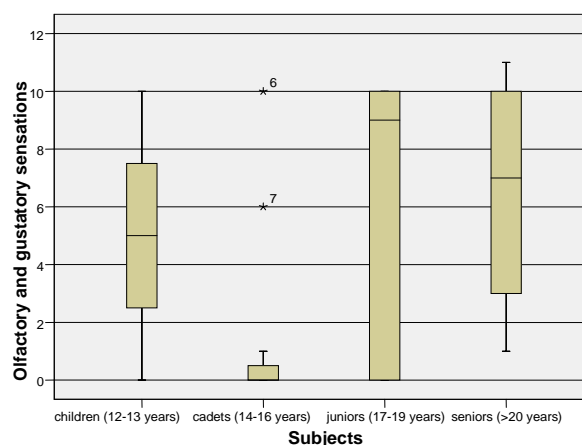


Fig. 8 – Box plot diagrams – olfactory, gustatory sensations.

Statistical processing

Statistical processing was performed using the SPSS 15.0 software. For the comparison of the means between the groups of subjects, we applied the ANOVA test and for multiple comparison, the post hoc Bonferroni test, the significance threshold being $p \leq 0.05$. The correlation between the variables was established through the Pearson correlation coefficient (r), the significance threshold being $p \leq 0.01$. The diagrams drawn with the box plot method indicate: the minimum and maximum value; the median, percentiles 75 and 25; extreme scores.

ANOVA statistical results obtained (Table V).

Table V
Analysis of the results of the ANOVA test

Indicator	Mean square	F	p
Visual sensations	39.991	1.918	.158
Auditory sensations	202.838	8.306	.001
Kinesthetic sensations	133.944	2.106	.130
Olfactory and gustatory sensations	40.991	2.466	.090

* The main difference is significant at a value of .05

The training method (NLP) has significant differences only in the case of auditory sensations ($F=8.30, p=0.001$). After the Bonferroni adjustment of the number of comparisons, significant differences were found between the means of cadets and juniors ($MD=12.164, p=0.001$), and between those of cadets and seniors ($MD=8.53, p=0.016$). The mean of the auditory sensations of cadets ($M=25.36, SD=4.5$) was significantly higher than the mean of juniors ($M=13.3, SD=2.77$) and seniors ($M=16.83, SD=4.62$). In the other cases of the comparison of the means, there was no significant difference (Table VI).

Table VI

Analysis of the results of post hoc tests - multiple comparisons - Bonferroni.

Dependent variable	(I) Subjects	(J) Subjects	Mean difference (I-J)	Std. error	Sig.
Auditory sensations	Children (12-13 years)	Cadets (14-16 years)	-6.030	3.219	.450
		Juniors (17-19 years)	6.133	3.609	.624
		Seniors (>20 years)	2.500	3.494	1.000
	Cadets (14-16 years)	Children (12-13 years)	6.030	3.219	.450
		Juniors (17-19 years)	12.164 (*)	2.665	.001
		Seniors (>20 years)	8.530 (*)	2.508	.016
	Juniors (17-19 years)	Children (12-13 years)	-6.133	3.609	.624
		Cadets (14-16 years)	-12.164 (*)	2.665	.001
		Seniors (>20 years)	-3.633	2.992	1.000
	Seniors (>20 years)	Children (12-13 years)	-2.500	3.494	1.000
		Cadets (14-16 years)	-8.530(*)	2.508	.016
		Juniors (17-19 years)	3.633	2.992	1.000

*The most important difference is significant at a value of .05

Table VII

Analysis of results – Correlations

Indicator	Significance	Visual sensations	Auditory sensations	Kinesthetic sensations	Olfactory and gustatory sensations
Visual sensations	r	1	.270	.593(*)	-.037
	p		.192	.002	.861
Auditory sensations	r	.270	1	.652(*)	-.293
	p	.192		.000	.156
Kinesthetic sensations	r	.593(*)	.652(*)	1	-.300
	p	.002	.000		.145
Olfactory and gustatory sensations	r	-.037	-.293	-.300	1
	p	.861	.156	.145	

*The correlation is significant at a value of 0.01

Correlations

There is a significant positive correlation between visual sensations and kinesthetic sensations ($r=0.59$, $df=23$, $p<0.01$) and between auditory sensations and kinesthetic sensations ($r=0.65$, $df=23$, $p<0.01$) (Table VII). There is no significant correlation between kinesthetic sensations and olfactory and gustatory sensations. The subjects whose visual and auditory channels are stimulated will also have positive effects in the kinesthetic area. Sport is a complex social phenomenon, and the concepts within it are rarely unidimensional, that is they cannot be measured using a single question (Ian, Iones & Chris Gratton, 2004).

Conclusions

1. Values of *visual submodality* distinctions. In the children category, there is one athlete who has visual preferences with the value 8. In the cadet group, there are 3 athletes with values of the visual components higher than 10, which represent the largest group. In the junior group, the maximum value is 8.

2. *Auditory submodality* distinctions in the process of training. There is one athlete in the cadet category (14-16 years) that uses auditory submodalities with the value 7. In the future, this aspect should be worked on in order to develop the ideomotor representations of motor acts, of the technical elements of training.

3. The analysis of data for *kinesthetic submodalities* shows that there are 2 athletes, one in the cadet group and the other in the children group, who use in the case of ideomotor representations certain kinesthetic sensations, with the values 9 and 10.

4. In the analysis of sensations felt during ideomotor representations, the different submodalities of each sensation, the digital type, are considered. The need for the clarity of thoughts associated with action and with all submodal distinctions of NLP. In addition, the athletes have to focus on the present moment (Vittoz & Godefroy, 2001). It is very important for the technical staff to understand the optimal communication modality with each individual athlete, so that the athletes can reach optimal results in major national and international competitions.

5. The training method (NLP) has significant differences only in the case of auditory sensations.

6. The mean of the auditory sensations of cadets is significantly higher than the mean of juniors and seniors.

7. There is a significant positive correlation between visual sensations and kinesthetic sensations and between auditory sensations and kinesthetic sensations. There is no significant correlation between kinesthetic sensations and olfactory and gustatory sensations.

Conflicts of interests

Nothing to declare.

Acknowledgments

The article is based on a study for the ongoing doctoral thesis of the first author.

Authors' contributions

The first two authors were responsible for the theoretical fundamentation of the article and data recording. The last author was responsible for data processing.

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Dry land training and swimming performance in children aged 11-12 years

Antrenamentul specific pe uscat și performanța la înot la copii de 11-12 ani

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Abstract

Background. Muscle strength is one of the most important motor qualities, which largely influences the speed of execution of movements and activities that require strength and skill. When carrying out this study, we had in mind that most elite swimmers use swim benches in dry-land training and for performance diagnosis.

Aims. We aimed to emphasize the importance of dry-land strength and power training for swimming performance in children.

Methods. A number of 20 female swimmers, aged 11 to 12 years, members of the Swim to Perfection Sports Club Cluj-Napoca, took part in the study, for a period of 4 weeks. They attended a special training program 3 times a week (Monday-Wednesday-Friday), a number of 5 repetitions of 35 seconds each (butterfly style). The training sessions were conducted using the biometer isokinetic trainer. Two testings for 50 m (butterfly style), on day 1 and day 28 were performed.

Results. Our data show that four weeks of specific training, using the biometer isokinetic trainer, improve the athletic performance of young swimmers.

Conclusions. Dry-land strength training using the swim bench may enhance the ability to produce propulsive force in water, especially in short distance races.

Key words: exercise, strength, power, biometer isokinetic trainer – swim bench.

Rezumat

Premize. Forța musculară este una din cele mai importante calități motrice, care influențează în mare măsură atât viteza de execuție a mișcărilor, cât și activitățile care necesită rezistență și îndemănare.

Obiective. Ne-am propus să evidențiem importanța antrenamentului de forță și putere pe uscat în performanța la înot, la copii.

Metode. La studiu au participat un număr de 20 sportive, cu vârsta de 11-12 ani; lot martor, (m=10), lot sportive (s=10), înotătoare, componente a Clubului Sportiv "Swim to Perfection" Cluj-Napoca, vârsta 11-12 ani, timp de 4 săptămâni. Acestea au efectuat un antrenament specific de 3 ori pe săptămână (luni-miercuri-vineri), un număr de 5 repetări a 35 de secunde fiecare (procedeu fluture). Antrenamentul s-a efectuat pe simulatorul biometer isokinetic trainer, banca de înot. S-au efectuat două testări pe distanța de 50 m, ziua 1 și ziua 28.

Rezultate. Rezultatele cercetării arată că patru săptămâni de antrenament specific pe uscat, folosind simulatorul - banca de înot, duc la îmbunătățirea performanțelor sportive a tinere înotătoare.

Concluzii. Antrenamentul de forță pe uscat cu banca de înot poate stimula abilitatea de a produce forța propulsivă în apă, cu preponderență în probele de scurtă durată.

Cuvinte cheie: efort fizic, forță, putere, bancă de înot (simulator).

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Introduction

Muscle strength is one of the most important motor qualities, which largely influences both the speed of execution of movements and the activities that require strength and skill.

Muscle strength can be defined as the possibility of a muscle or muscle groups to voluntarily produce force or a couple against external resistance, under specific conditions defined by muscle action, speed of movement and posture (Siff, 2000; Stone et al., 2007; Zatsiorsky, 1995, Miller, 2012, cited by Suci & Popovici 2013). Maximum muscle strength is the possibility to voluntarily produce maximal force or an external resistance couple under specific conditions defined by muscle action, speed of movement and posture (Gavin, 2012).

Muscle strength is a fundamental property of human performance that provides important information on human performance by evaluating the effects of training. This can be defined as the "ability to overcome internal and external resistance by muscle contraction" (Tudor, 2002), the strength parameters being recently proposed as one of the multifactorial phenomena that improve swimming performance (Barbosa et al., 2010).

The tests used for determining muscle strength are a way of monitoring the response to the training program (Stone et al., 2007, cited by Gavin, 2012); in order to measure the necessary load in strength training (Baechle et al., 2008; Bompa & Haff, 2009) and to monitor recovery after injuries (Flanagan et al., 2008, Meller et al., 2007).

Dry-land training using the swim bench is used by the majority of elite swimmers for diagnosing performance, generally measuring mechanical strength. Athletes train on the swim bench for 1 hour and 45 minutes, compared to 3 hours, the duration of training in the water (Shoulberg, 2012).

Dry-land training allows to create an efficient swimmer, without injuries, who is capable of adapting to any stress and competition conditions; the aim is to better train the human body out of the water to be effective in the water environment (Gambeta, 2012).

Objectives

We aim to evidence the importance of dry-land strength and power training for swimming performance in children.

Hypothesis

We assume that dry-land training with the biometer isokinetic trainer will improve strength and will also have a great impact on performance, increasing it.

Material and methods

Research protocol

We mention that according to the Helsinki Declaration, the Amsterdam Protocol and Directive 86/609/EEC, the approval of the Ethics Board of the "Babeş-Bolyai" University of Cluj-Napoca for carrying out the research on human subjects, as well as the informed consent of the parents and subjects participating in the research were obtained. The swimmers attended the usual training program with the swimming team throughout the duration of the research. No swimmer withdrew from the study.

a) Period and place of the research

The research was carried out at the Universitas Swimming Complex of the "Babeş-Bolyai" University, over a period of 4 weeks, in May 2013.

b) Subjects and groups

The study included 20 female swimmers (n=10 swimmers/group), having practised swimming for 5 years, members of the Swim to Perfection Sports Club Cluj-Napoca, aged 11-12 years. The control group (C) performed usual training in the water, and the group of swimmers (S) performed in addition to usual training in the water, specific training 3 times a week (Monday-Wednesday-Friday), a number of 5 repetitions of 35 seconds each (butterfly style). Training was conducted on the biometer isokinetic trainer (produced by the Fahnmann company, Germany).

c) Tests applied

Two testings for 50 m (butterfly style), on day 1 and day 28 of training were performed after a low intensity 1000 m warm up session. Time (T1 and T2) and speed (V1 and V2) were measured.

d) Statistical processing

Statistical processing used the Excel application (Microsoft Office 2007) and the StatsDirect v.2.7.2 software. The results were graphically represented using the Excel application (Microsoft Office 2007). The data were uniformly distributed, so the Student test for paired samples was applied.

Results

Table I shows the comparative analysis of time values in the studied groups, moments T1 and T2, and statistical significance. The statistical analysis of time values between moments T1-T2 evidenced highly statistically significant differences in group S ($p < 0.001$) and statistically significant differences in group C ($p < 0.05$). The statistical analysis of time values between the groups showed statistically significant differences at moment T1 ($p < 0.05$) and very statistically significant differences at moment T2 ($p < 0.01$).

Table I

Comparative analysis of time values for the 50 m distance (sec) at the studied moments and statistical significance.

Group	Moment	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p) between moments (T1-T2)
S	T1	35.475	0.9683	34.58	3.0622	31.8	41.15	0.00096
	T2	34.844	0.9557	34.22	3.0223	31.15	40	
C	T1	39.184	0.9209	38.925	2.9120	34.5	44.33	0.0177
	T2	39.074	0.9180	38.78	2.9030	34.41	44.3	
Statistical significance (p) between groups (S-C)				T1	0.01247	T2	0.005	

Table II

Comparative analysis of speed values (m/sec) at the studied moments and statistical significance.

Group	Moment	Mean	SE	Median	SD	Min.	Max.	Statistical significance (p) between speeds (V1-V2)
S	V1	1.42	0.0381	1.45	0.1204	1.22	1.59	0.001229
	V2	1.44	0.0384	1.46	0.1214	1.25	1.61	
C	V1	1.28	0.0301	1.28	0.0951	1.13	1.45	0.027
	V2	1.29	0.0309	1.29	0.0976	1.13	1.47	
Statistical significance (p) between groups (S-C)				V1	0.01107	V2	0.005	

Table III

Statistical analysis of correlation between the values of the studied indicators.

Group	Indicator	IMC	T1	T2	V1			
S	T1	0.1303463	*					
	T2	0.1019385	*	0.9907869	****			
	V1	-0.1139987	*	-0.9948539	****	-0.9891799	****	
	V2	-0.106651	*	-0.9856435	****	-0.9972947	****	0.9908042
C	T1	-0.4279911	**					
	T2	-0.4092353	**	0.9991517	****			
	V1	0.4531697	**	-0.9968396	****	-0.9955243	****	
	V2	0.4325717	**	-0.9937095	****	-0.9940664	****	0.9986301

Table II presents the comparative analysis of speed values in the studied groups and statistical significance. The statistical analysis of speed values evidenced very statistically significant differences in group S ($p < 0.001$) and statistically significant differences between the same moments in group C ($p < 0.05$). The statistical analysis of speed values between the groups showed statistically significant differences for speed V1 ($p < 0.05$) and very statistically significant differences for speed V2 ($p < 0.01$).

Table III presents the statistical analysis of correlation between the studied indicators.

The statistical analysis of correlation between the values of the studied indicators showed the following:

- for the group of swimmers:
 - a very good positive correlation between T1-T2 and V1-V2;
 - a very good negative correlation between V1-T1, V2-T1, V1-T2, V2-T2.
- for the control group:
 - a very good positive correlation between T1-T2 and V1-V2;
 - a very good negative correlation between V1-T1, V2-T1, V1-T2, V2-T2.

Discussion

Potts et al. (2002) evidenced the importance of using the swim bench in training for the correction of the technique and found at the same time a strength imbalance between the two arms, which would have important implications in the optimization of performance.

Studies performed on female swimmers, with creatine supplementation, have shown that the supplementation had no beneficial effects on performance and did not improve speed; in contrast, swim bench training had beneficial effects on performance (Dawson et al., 2002).

Swim bench training results in an obvious increase in strength, under the conditions in which the number of imposed cycles also increases, which allows the athlete to "mobilize" more strength in an event (Ignat, 2006).

Swim benches are useful for diagnosing individual

performance if mechanical strength is acquired (Heller et al., 2004).

During simulated swimming, the legs can support more power compared to arms. Also, the intra-subject variation in measuring strength is low using dry-land ergometers. These assessment methods might be useful for explaining swimming performance and for monitoring the changes that occur during training (Swaine, 2000).

Our results emphasize the importance of using the swim bench in dry-land training. Dry-land strength training using swim benches can stimulate the ability to produce propulsive force in water, predominantly in short distance events.

The comparative analysis of the groups shows an improvement of time as well as speed between the two testings, which leads to an increase of sports performance in the 50 m butterfly event, the results being more significant in the group of swimmers compared to the control group.

Three swimmers of the group participating in the research won the National Champion title in various events, which recommends the use of the swim bench in dry-land training.

Conclusions

1. Dry-land training on the biometer isokinetic trainer for four weeks has beneficial effects, with the improvement of time and speed in the 50 m butterfly event.
2. Dry-land training using the swim bench improves sports performance compared to training in the water.

Conflicts of interests

Nothing to declare.

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A psychokinetic approach regarding the relationship between physical education and psychomotor education of children

O abordare psihocinetică privind relația dintre educația fizică și educația psihomotrică a copiilor

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Abstract

Background. Educability of motor skills and psychomotor education of normal children or those with mental or motor disabilities has a significant role in early educational intervention. The content and special methodology of motor and psychomotor development is generally associated with inherited motor skills or, as appropriate, the disorders produced by various dysfunctions.

Aims. The growing and developing process of the child, either normal or dysfunctional, which could be affected and can influence psychomotor behavior, is more pronounced as the degree of the expression level of motor skills (i.e. gifted children) or conversely, if the deficiency is more profound. We can talk about the configuration of special educational objectives, for all categories of children: normal, gifted, or conversely, for those with impaired motor skills.

Methods. The novelty of our research consists of a psychokinetic approach to the relationship between motor skills education and psychomotor education in the context of motor and physical education of children up to age of 12. We can even talk about psychokinetic complementary methods, associated and adapted to the usually psycho-pedagogical tools.

Results. In this manner, the movement in all its forms related to global or fine motor ability of the children should and could become a very important prophylactic and therapeutic educational means, both of a prophylactic and therapeutic nature at early schooling.

Conclusions. Psychomotor learning exceeds the physical education context, as a discipline, being encountered in various instrumental learning activities extended to other curriculum areas as a contributing factor and precursor of the development of the child's operating intelligence.

Key words: psychokinetic approach, motor genotype, motor phenotype, psychomotor education, instrumental learning.

Rezumat

Premize. Formarea deprinderilor motrice și educația psihomotrică a copiilor normali sau la cei cu dizabilități au un rol important în intervenția educațională timpurie. Conținutul și metodologia specifică a dezvoltării motrice și psihomotrice a copiilor este, în general, adecvată nivelului și portofoliului individual de deprinderi motrice, susținute de un fond aptitudinal moștenit sau după caz, afectată de tulburările produse de diverse disfuncții.

Obiective. Procesul de creștere și dezvoltare al copilului normal sau disfuncțional, poate fi afectat și poate influența, la rândul său, comportamentul psihomotor al acestuia, într-un grad mai mare sau mai redus, ca expresie a nivelului deprinderilor motrice pe care le deține. Putem vorbi despre structurarea unor obiective educaționale în contextul temei studiului, stabilite pentru toate categoriile de copii: normali, cu aptitudini înalte.

Metode. Noutatea problematicii cercetării noastre constă într-o abordare din perspectivă psihocinetică a relației dintre deprinderile motrice și educația psihomotrică în contextul educației motrice și fizice a copiilor până la vârsta de 12 ani. Putem vorbi de conceperea unor metode psihocinetice complementare, asociate și adaptate instrumentarului psihopedagogic utilizat în mod curent în astfel de situații.

Rezultate. În acest fel, mișcarea, sub toate formele sale de manifestare, referitoare la motricitatea globală sau fină a copiilor, ar putea și ar trebui să devină un foarte important mijloc educațional de natură profilactică și terapeutică la vârsta școlarității timpurii.

Concluzii. Educația psihomotrică excede contextului educației fizice, ca disciplină de învățământ, putând fi aplicată sub forma unor diverse activități de învățare instrumentală extinse în mai multe arii curriculare, ca un factor contribuitor și ca un precursor al dezvoltării inteligenței operante a copilului.

Cuvinte cheie: psihocinetică, genotip motric, fenotip motric, educație psihomotrică, învățare instrumentală.

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Introduction

The present study starts from the assumption that the development of a child's motor skills, during its ontogenetic development, is an extremely complex process having numerous and unexpected connections with their mental development, approached from an intellectual, affective-emotional and volitional perspective.

The motor skills of an individual are represented by the "genetically motor skills, such as motor genotype skills" that are in a complementary relationship with the ones "acquired through learning, repetition, instruction, training, such as abilities and motor skills - the latter representing the individual's motor phenotype" (Neagu, 2012, p.18).

This relationship is reflected in a series of studies that try to answer an already known question: *nature versus nurture?* It means nature versus supply (meaning an external influence). The first one who asked this question was Sir Francis Galton (1822-1911), one of the most important founders of differential psychology.

Currently, this binary relationship continues to elicit interest, assigning the most important role to one or the other of the two components, the so-called factorial primordial influence on the development of an individual (mental or physical). The most eloquent answer to the previous question regarding which factors, native or acquired, prevail in influencing personality development was given by Canadian psychologist Donald Hebb (1904-1985), who replied with another question: "Which of the dimensions contribute the most to determine the area of a rectangle: the length or the width?" (Meaney, 2004). Obviously, in the case of human individuals, the strict analogy with the differential of the two sets of influencing factors from the examples above may be restrictive, but such analytical elements could be significant in the context of the characteristics range of an investigated human community (population, sample etc.) (Rich-Harris, 2006).

In our view, "Human motor skills heritability should not be treated as an opposable element to motor skills acquired through learning. Complementarity and inter-relationship with mutual enhancement effect (Fig.1), defines most appropriately the relationships with factorial influences on general motor behavior of an individual" (Neagu, 2010). "The covariance of the two influence factors categories expresses most appropriately the relationship between them and their joint action on the motor skills fund of an individual. To acknowledge a theory that emphasizes the invariance of the relationship between genotypic and phenotypic human factors is, in our view, limited or even inaccurate" (Neagu, 2012).

The effect of the enhancement phenomenon between these two components of area I and III as influencing factors of motor skills performance will be the induction of an inferential process between the genotypic component (native motor skills) and the phenotypic one (acquired motor skills).

Kaighobadi & Shackelford (2008), in the study "Investigating the Mystery of Individuality", dedicated to Rich Harris's researches (2006), mention a double influence on the overall development of an individual, being exposed "to effects of genes, as well as to effects of context" such as external influences.

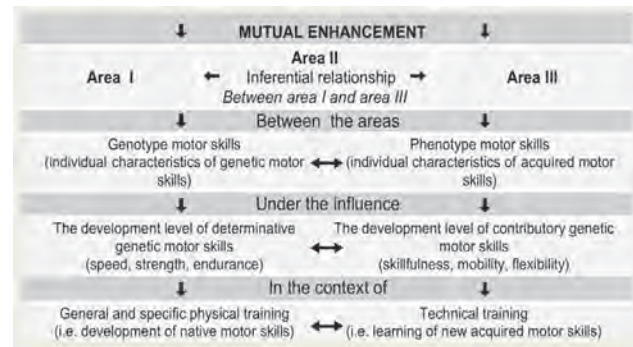


Fig. 1 – Customizing the process of mutual enhancement in the context of the relationship between genotype and phenotype motor skills (Neagu, 2012).

Theoretical background

A primary assumption is the one set by us three years ago, that "The wide domain of didactics enters increasingly and in a more elaborate manner, in most spheres of the educational field" (Neagu, 2010), including school physical education. Two of the pursued aims are to ensure the harmonious somatic development of children, and also the development of their personality on the whole.

The argumentation of our study consists of an approach from a different perspective of what is widely known about the development of a child's motor skills. It is about physical education, as part of the so-called "early educational architecture of children" (Neagu, 2012). Therefore, we want to discuss in a disjunctive manner a series of concepts, which apparently would achieve the same educational goals. These concepts, only apparently somehow similar in terms of means, methodologies and specific educational objectives are: physical education, motor skills education and psychomotor education.

The limits that we found in the categorization of *physical education* as an educational discipline may be summarized as follows:

- Physical education is considered a *minor school discipline*;
- Physical education is not yet detached from the *body-mind dualism*, being considered that it would only address the body;
- Unfortunately, physical education is not yet imposed as a *fundamental means of education*;
- A significant part of the means used in teaching physical education is *specific to the sports field*;
- Currently, in Romania, there is no clear delineation of the concept of *educational sport* as a component of physical education, a concept that we support as being highly important and that should be clarified as soon as possible (Fig. 2).

For the reasons outlined above, we can say that during the child's development, ranging from birth to approx. 10-12 years of age, physical education must be constructed as an *educational composite* consisting of physical education, motor and psychomotor education, where "psychomotor education should form one of the major educational and curricular priorities" (Neagu, 2012).

One of the disjunctive elements is that *psychomotor education* is mainly targeted towards developing the fine

motor skills of the child, their knowledge about their corporeality (body schema), their awareness and development of body laterality, their spatial and temporal orientation, static and dynamic balance, their somesthetic and kinesthetic sense and finally, their mental representation capacity of motor ideograms. These components are particularly important in this period of ontogenetic development of children.

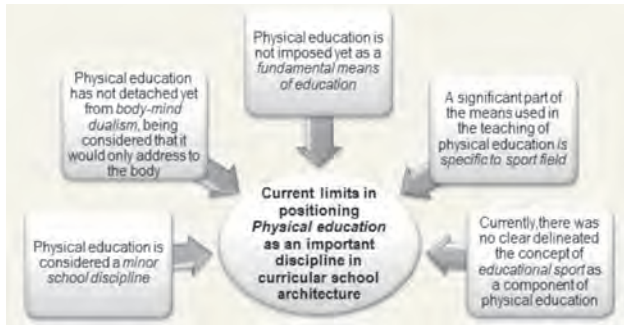


Fig. 2 – The current limits in positioning physical education as an important discipline in curricular school architecture (Neagu, 2012).

The complexity and the vastness of the psychomotor domain of a child - i.e. his psychomotor education, results from its dimension, approached from a dual perspective: *longitudinal and transversal* (Albu et al., 2006).

The *longitudinal approach* refers to the fact that psychomotor education "is diachronically conducted on a study field, temporally extended, that starts with the first interventions on infants, in the sense of its early sensory stimulation" (Neagu, 2012) and which will be expanded to the interventions such as maintenance and care "of the elderly psychomotor faculties" (Ballouard, 2008).

The *transversal approach* consists of at least two defining elements. The first one is related to scientific substantiation, extremely complex, such as quintessential extract, i.e. composite type, from a multitude of sciences: biological, psychological and sociological - all this related to human motor skills.

On the other hand, *motor education* as a result of physical and sport education has as main targets: the *development of global motor skills*, of the child's general motor capacity, of large body movements, both in terms of the area of native motor skills (skills development) as well as the development of general acquired motor abilities and skills (locomotor and non-locomotor) - through the motor learning process (Fig. 3).

Both components are important in the configuration, the development and improvement of the motor capacity of the child in his growing and developing process, but often "psychomotor education is overlooked or even ignored in the complex educational act, exactly in maximum educational plasticity period, specific of age within the range of 4-12 years" (Neagu, 2012).

Gravel & Tremblay (2004), referring to the importance of early age psychomotor education, remind us of Bernard Aucouturier's research (Bernard is the founder of preventive and therapeutic educational psychomotor practice). Inspired by the studies of Klein, Winnicot and Wallon (in psychoanalysis) and those of Piaget, Aucouturier laid the

foundations for the practice of psychomotor education, which in his view, focuses on "the motor expressivity of the child, as a way of expressing his affective and imaginary life". He insists on "motor expressivity development as a maturing mental itinerary, using the game as a fundamental axis of the practice" (Gravel & Tremblay, 2004).

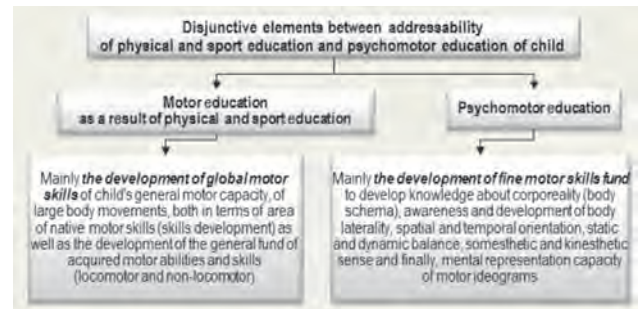


Fig. 3 – Disjunctive elements between addressability of physical education and psychomotor education of the child (Neagu, 2012).

However, at this stage some delays can be identified, as well as gaps or different disorders and obviously we can intervene preventively by differentiated means and methods specific to a small group, or even individualized.

Among the general goals of psychomotor education in this age range, we mention (Fig. 4):

- Acquiring new "procedural knowledge" (Famose, 1996; Famose, 2002; Famose, 2006), defined by us as "eupraxis knowledge" (Neagu 2010), more differentiated as a support of the child's body integration in his environment;
- Generally, obtaining significant support in the school learning process and specifically in school instrumental learning;
- Voluntary control of the body (as a system) and various body parts and segments;
- Improving mental concentration capacity, memory and relaxation;
- Accommodation and progressive adaptation of the organism to physical and mental requests, specific to carefully directed effort;
- Developing the independence level and approaching of the general corporeal motor autonomy;
- Developing an appropriate self-image, followed by self-awareness and finally, balanced self-esteem;
- Creating the possibility of constantly having new body experiences that will facilitate learning and motor, sensory-motor and perceptual-motor control, with positive effects on the child's development;



Fig. 4 – General goals of psychomotor education (Neagu, 2012).

Rigal (2004); Rigal (2007) describes three main axes of intervention in the psychomotor education of the child, as follows:

- Psychomotor education – the development of intelligence through motor action;
- Psychomotor rehabilitation – self-control restoration of movements;
- Psychomotor therapy - awareness and relationship with one's own corporeality, the relationship with others and the relationship with the surrounding environment (Fig. 5).

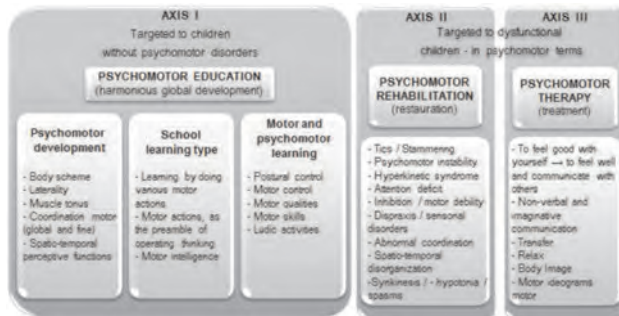


Fig. 5 – Educational psychomotor spectrum in children - Axes of intervention. Adapted from Rigal (2004) și Rigal (2007).

Defining psychomotor education elements from a psychokinetic perspective

The French doctor in medicine (specialized in functional rehabilitation and psychomotor field), Jean Le Boulch, licensed in psychology - as well as athletics and basketball coach - is the first one who introduced the concept of *psychokinetics* in 1966. This new approach has revolutionized the approach to physical education, *psychokinetics* being originally defined as a *science of human movement* - much too fastidious, (op-ed), and later redefined as a *general theory of human movement*, to be finally crystallized as the *psychomotor education of children*, aged under 12, specific to the pre-school and primary school levels (Le Boulch, 1971). The disjunctive element in relation to the actual term of *physical education*, *psychomotor education* is to use movement as a generating educational factor in very different forms of movement. Introducing this concept, Le Boulch wanted to permanently eliminate *body & spirit* dualism, as the so-called traditional connotation of *physical education* completely disappeared in addressing the new concept, *psychomotor education* (Le Boulch, 1984 Le Boulch 1995).

Thus, Le Boulch expanded the educational field beyond corporeality movement, by taking it to what we define as *education for movement by movement*, as an important precursor of the child's *operating thinking* by operating with abstract concepts: generalization, induction, deduction, analysis, synthesis etc.

We witness an approach of a new concept, that of the child's personality global, unitary, systemic development where even the *psycho-motor* binary script becomes a unique word - *psychomotor*. In this context is explained Le Boulch's desire to extrapolate the term *physical education* (the term itself sends us to physicality, corporeality) to *psychomotor education*, an integrative and unitary vision between body-movement and psyche (Le Boulch, 1984, Le

Boulch 1995). We are fully subscribing to this conception, this being one of the reasons for developing our study.

Possible developing directions of the psychomotor education concept in the curricular architecture

The main underlying principle of *psychomotor education*, namely that of educational action through multiple forms of movement (which exceed the sports field, as a feature of the means used in current physical education) has as an operating form the centering of this action on the development of the child's psychomotor behavior development. Consequently, *psychomotor education* should be better represented in nursery and primary curriculum cycles.

By approaching a global conception of education, indispensable to any child, it becomes applicable in all educational areas where movement is present in various instrumental-operating forms, such as:

- Writing, graphics, technical drawing, artistic drawing, painting, sculpture, molding activities.
- Construction, traditional crafts, electronics, mechanics, robotics.
- Choreography, performing arts, dance, ballet etc.

Finally, we emphasize the *mutual enhancement relationship* between native motor skills and sports motor skills. Thus, we penetrate the *inference area* (complementary, positive effects) and not the *interference relationship* (disharmony, negative effects) between *psychomotor education* and *sports education*, earlier defined by us as *educational sports*.

Other benefits complete the picture of the positive influence of psychomotor education:

- Language development of the child (verbal, non-verbal and paraverbal) that will be associated with his own actions and spatial-temporal perceptions, having a symbolic role in the patterning of the child's body scheme and of the spatial-temporal environmental dimension (all types of motions – his own and other individuals' or objects' movements).
- Buildup of new and basic acquisitions (5-8 years) on the body schema which is better focused; also laterality, still relatively stabilized at this age.
- Perception (the quick look) of the movement forms, their storage, ideomotor representation and ultimately, their reproduction such as form, structure, succession and other characteristics (rhythm, tempo, cadence, coordination, synchronization, correctness, precision, accuracy), moving on music (dance, choreography, movement games) or rhythm and frequency of movements imposed by various associated sounds (percussion, whistle signal, given commands etc.).
- Global adaptation and movement execution regulator feedback - from the cognitive level to the postural (somesthetic) level, by body and limb axes and finally, to the dynamic (kinesthetic), motor-operated level.
- Refined adaptation of fine motor skills.

Expected goals/purposes

By providing the motor behavior fundamentals outlined above, it will become a predisposing factor, a feed forward type, that will facilitate the entry into the next stage of psychomotor education-deepening (9-12 years). This will

be accomplished by:

- Achieving the child's motor autonomy through adaptation and overall appropriateness - cognitive and motor-perceptive.

- Optimizing the orientation and spatial-temporal structure.

- Correct mental representation, in form, structure and movement succession.

- Adequate and timely problem solving situations with a high degree of difficulty or complexity;

- Outlining the important role of psychomotor education in instrumental school learning.

- Demonstration and validation through future studies of the inter- and transdisciplinary vocation of psychomotor education (as a point of convergence of educational efforts in the motor and intellectual fields).

- Reaffirming psychomotor and physical education as important school disciplines.

- They should not be manifest forms of the child's effort and biological performance but must represent fundamental components (basic) in the school learning process, as a whole.

- Development of intelligence, along a cognitive acquisitions route (as important precursors of personality) toward intellectual and socio-behavioral gains.

- Strengthening intellectual processes starting from effective handling (practice) and reaching concept handling (thinking) having as precedence personal motor experience (many concepts being disconnected at a time by the effective action that has generated them).

- Discovery and awareness of new forms of „physicality”, such as:

- "Energetic body" - effort perception and evaluation as a result of various movements.

- "Operative body" and "Attitudinal body" related to personal movements or other environmental movements: gearing, engagement, activation etc.

- Discovery and awareness of the collective dimension of movement as a precursor, to create:

- Group relating capacity (class, team, competition, regulations, self-control).

- Ability to devolve through partners (teammates, opponents, officials).

Conclusions

1. The child's body and movement are everywhere, in all school disciplines and in all activities carried out, even if some minimize or even deny its importance in the child's daily school program. One of the solutions that would be *resizing the role of movement* in the sense developed by us in this study is *the convergence of educational objectives between theoretical and practical disciplines*. It outlines a new concept that we propose: *an expanded educational field assigned to movement as an important factor in the overall development of the child, to help him relate with his own physical and environment in enjoyable, dynamic, adaptive and involved ways*.

2. All factors involved in the educational field must become inducers of a new mentality and general attitudes towards the role of movement in the overall development of the child, including sanogenic components, less approached in this study, such as *prevention and therapy*

of vicious body attitudes, of some metabolic diseases and nutritional disorders; combating childhood obesity and sedentary lifestyle, namely education for movement ecology, with various positive effects etc.

3. It must be transferred towards the collective consciousness that *motor and psychomotor education is not only performed during traditional physical education classes*, which are totally insufficient in terms of curricular allocation, duration and educational resources.

4. *Psychomotor education must become a complex and comprehensive educational instrument in curricular activities*, but also in various other extracurricular activities, currently totally insufficient.

5. *Psychomotor education must contribute to the formation of individual psychosocial values and behavior*, such as increased confidence in oneself and others, formation of the sense of self-esteem, of the sense of belonging to a team, collectivity and community.

6. *Psychomotor education must contribute, in addition to physical education, to the acknowledgment of skills in some exceptional native qualities* (particularly in sports prowess), where certain motor skills are involved at a high-level.

Conflicts of interests

Nothing to declare.

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The psychomotor guidance centre's strategy for promoting a healthy lifestyle through diversified and individualized free time programs

Strategia centrului de consiliere psihomotrică pentru promovarea unui stil de viață sănătos prin programe de timp liber diversificate și individualizate

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Abstract

Background. The inauguration of the Centre, also presented in the *Palestrica* of the third Millennium had as its main objective the optimization of mental processes and functions as well as motor activities by having the academic community adopt a healthier lifestyle.

Aims. To attract as many professors, researchers and auxiliary personnel in the Centre's activities, to elaborate personalized programs based on each participant's anatomical-physiological particularities, aptitudes, interests and preferences. Participants are counseled and guided through different aspects pertaining to the understanding of the necessity of practicing physical exercise, kinotherapeutic programs and recovery, resulting in a state of well-being, which is an essential element of health and professional effectiveness.

Methods. Research, anamnesis, somatic and functional parameter measuring, testing and evaluation, guidance, appointment and periodic re-evaluation, "market research" questionnaire, data processing and the mathematical-statistical method.

Results. The results show that, one year after the Centre's inauguration, the number of people eager to do physical exercise has risen. There has been a more intense rise in the 25-45 year old category and a less intense one in the 46-60 year old category. The former category seeks improvement in physical condition and body shaping. According to the readings, this category has managed to reduce body weight and perimeters resulting in an improvement in their physical condition. The latter category seeks to improve physical condition and to treat various diseases through kineto-physio-therapeutic programs.

Conclusions. The data found demonstrate that the suggested individualized programs reached the predicted results in improving physical condition and general resistance, which led to a good state of well being, with more focus and effectiveness in professional activities.

The results of the somatic-functional measuring motivated the participants to follow group and individualized programs.

Key words: motivation, individualized programs, health.

Rezumat

Premize. Deschiderea centrului nostru, eveniment prezentat și în revista *Palestrica* Mileniului III a avut ca scop principal atât optimizarea proceselor și funcțiilor psihice, cât și a activităților motrice, prin adoptarea unui stil de viață mai sănătos al comunității academice.

Obiective. Atragerea unui număr cât mai mare de profesori, cercetători și personal auxiliar în activitățile centrului nostru, elaborarea de programe personalizate în funcție de particularitățile anatomo-fiziologice, capacitățile, interesele și preferințele fiecărui practicant. În cadrul CCMC-UB practicanții sunt consiliați și îndrumați în diverse aspecte care țin de conștientizarea necesității practicării exercițiilor fizice, programelor kinetoterapeutice, refacerii și recuperării, având consecințe favorabile în privința stării de bine, factor esențial al sănătății și randamentului profesional.

Metode. Informarea și documentarea, anamneza, măsurarea parametrilor somatici și funcționali, testarea și evaluarea, îndrumarea, programarea și reevaluarea periodică, chestionarul „market research”, prelucrarea datelor și metoda statistico-matematică.

Rezultate. Pe baza datelor și rezultatelor culese, s-a constatat că în decurs de un an după deschiderea CCMC-UB, a crescut populația dornică de mișcare, fiind mai numeroasă între 25 și 45 ani și mai rară între 46 și 60 ani. Prima categorie de vârstă urmărește ameliorarea condiției fizice și modelării corporale. Conform măsurătorilor și-au redus greutatea și perimetrele, îmbunătățindu-și condiția fizică. A doua categorie de vârstă urmărește ameliorarea condiției fizice și tratarea unor afecțiuni cu ajutorul programelor kinetofizioterapeutice.

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Concluzii. Pe baza datelor culese din cercetare, programele individualizate propuse au dat rezultatele scontate prin ameliorarea condiției fizice și a rezistenței generale a organismului, concretizate printr-o bună dispoziție, putere de concentrare și randament în activitățile profesionale.

Rezultatele măsurătorilor somato-funcționale au motivat participanții să urmeze programele de grup și individualizate.

Cuvinte cheie: motivație, programe individualizate, sănătate.

Introduction

The inauguration of our Centre, also presented in the *Palestrica of the third Millennium* journal had as its main objective the optimization of mental processes and functions as well as motor activity by having the academic community adopt a healthier lifestyle.

In order to promote a healthy lifestyle, certain measures are required to take effect on different levels, including creating and implementing efficient educational programs (Bartholomew et al., 2006; Lotrean et al., 2008).

There are many companies that offer their employees health-centre memberships in order to promote a diversity of physical activities and physical exercise during free time as a means for overall health improvement, social integration, personality development and teaching responsibility and self-discipline through sport (Dumitrescu et al., 2010).

We suggest promoting corporal activities in every higher education establishment, providing the resources, founding this type of psychomotor counseling centre and raising the quality of life for the academic community. An individual's ability to exercise is the cause and movement itself is the effect (Bompa, 2001).

We started from the idea that through the evaluation of the bio-psychomotor index, subjects can get to know their level compared to the standard possibilities of their age, gender and social status group, and both obesity and transfer possibilities can be monitored in order to raise the quality of life and assess what the most efficient means for prevention and intervention are.

Health education activities can have poor results if they do not focus on relevant factors that determine unhealthy individual behaviours. Such a model is the I-Plan Model (De Vries, 1998).

The Centre hosts the following activities: aerobic gymnastics, maintenance gymnastics, dance, taekwondo, fitness, bodybuilding, table tennis, cardio programs, kinanthropometry, kinethotherapy, physiotherapy and outdoor activities (hiking or nautical sports).

Of all motor activities, hikes and fieldtrips are probably the most accessible forms of leisure, as they do not require outstanding motor abilities, the presence of a specialist or material resources and are not costly for participants. Since they take place outdoors, the proposed goals are multiplied in the direction of the ability to relax, physical tone, ability to know and the moral feelings that animate the subject or the group (Bota, 2006).

We wish to continue and improve these activities and as our financial possibilities increase, we wish to add sauna and massage facilities. The participants, represented by professors, scientists, and technical, economic and social-administrative personnel, are eager to try different new activities that can distract them from professional responsibilities and refresh them, so that they can continue

their work at full capacity.

Physically inactive subjects have higher levels of cholesterol or triglycerides in the blood than physically active people, which foster the onset of atherosclerosis and other cardiovascular diseases (Derevenco, 1998).

Researches have proven that the development and maintenance of muscle mass is the solution for avoiding the decay of immunity, atrophy and the onset of diseases often associated with the ageing process. As hormone levels and activity diminish, senile atrophy occurs. After the age of 30, the muscle mass begins to decrease, after the age of 50, climbing the stairs becomes a problem, and with ageing, innervation disorders appear in different tissues, so that at the age of 70, 40% of the muscle mass is lost.

Appreciating the importance of muscular performance linked to bone quality and also, the risk of relapse with its implications, we try to focus on implementing some specific adapted kinethotherapy programmes, which could be used according to age particularities (Dinu et al., 2011).

People who frequently participate in the courses of our centre are adults between 24 and 60 years old. They are mostly sedentary people who wish to change something in their life and especially to feel better.

For a sedentary adult, physical effort is represented by occupational effort (professional activity), domestic physical effort and possibly, occasional or recreational effort (Bocu, 2007).

At the University of Bucharest, professors, scientists and some of the TESA personnel have a professional activity that is mostly neuropsychic – high neural strain to the detriment of the neuromuscular component. These physically inactive adults present a higher risk of developing one of the following conditions:

- they are twice as predisposed to developing coronary diseases;
- they are predisposed to high blood pressure;
- high risk for colon cancer (3.6 times higher than for active people);
- high risk for developing type II diabetes;
- low bone density, which in time leads to osteoporosis (favouring more frequent fractures);
- high risk for cancer, osteoarthritis and spine conditions.

Another aspect is that since the need for exercise is a fundamental instinct, it can be channeled towards beneficial activities – obviously with adequate instruments and skilled animators. Otherwise, repressed energies may generate self-destructive or society-destructive behaviour (Ganciu et al., 2010).

By opening this Centre for psychomotor counseling, we wanted to attract a great number of professors, scientists and TESA personnel in the activities of our center, to inform them about the professional and ageing risks for sedentary persons.

Sedentary behaviour and physical activity represent essential components of lifestyle, models of physical, social and mental behaviour (Cordun, 2009).

Given the literature data, the types of methods and their characteristics begin to settle into shape and the advantages/disadvantages of each method, as well as different practical aspects that can be useful in research activity, are underlined (Lotrean & Mejia, 2010).

At CCMC-UB, participants are counseled and guided in different aspects related to the awareness of the necessity of physical exercise, kinetherapeutic programmes and recovery, which cause favourable effects for well-being, an essential factor of health and professional efficiency (Art. 5. of R.O.F. of CCMC-UB).

Most of the scientists have highlighted the necessity of new studies with the purpose of determining the type and the application method of a therapeutic exercise with a view to improving muscular and functional performance (Taylor et al., 2007).

The specific activities of CCMC-UB (*. 2010)**

A. Counseling

- psychomotor counseling;
- informing about the facilities granted to professors and TESA personnel;
- orientation with the purpose of making them aware about the opportunities of spending spare time;
- psycho-physical preparation;
- orientation in corporal and recovery activities according to the anatomico-physiological particularities of each participant;
- identification and improvement of different static vertebral afflictions;
- nutrition counseling;
- morpho-functional and motor ability and capacity diagnosis;
- applying deontologically approved psychosocial tests to employees;
- organizing cultural and entertainment sports events (hikes, mountain skiing, nautical tourism, etc.);
- collaborating with different associations and professional organizations with the same objectives (national and international).

B. Administrating informational resources through

- creating a database with the anthropometric, motor and physiological parameters of the employees;
- systematization of location for physical activity offers in a virtual database;
- gathering information resources pertaining to the specialization and development opportunities in the PE area;
- creating a collection of training programs, analytical programs and monitoring sheets for training sessions and calory burning;
- pamphlet and poster distribution, posting up-to-date information on the Centre's site.

C. Financial resources

Raising funds in order to diversify the range of the Centre's activities by organizing and hosting different activities in order to promote programs and fundraisers for the endowment and the administration of the resources.

D. Punctual projects:

- organizing sports events for all course participants;
- publications with information relating to certain physical disciplines and their benefits for health and personality development through sport;
- opinions and cultural essays of academics and students from the physical education and health background.

Paper objectives

Attracting as many professors, researchers and TESA personnel as possible to our Centre's activities, creating personalized programs for their anatomico-physiological particularities, capacities, interests and preferences.

During the Centre's courses, the participants are counseled and guided in different aspects pertaining to the awareness of practicing physical activities, kinetherapeutic programs and recovery with favourable consequences on their well-being, which is an essential factor of health and professional efficiency.

Hypothesis

Through individualized and group programs, diversified according to the participants' requirements and possibilities, we stimulate the participants' state of well-being, improve the BMI and increase their wish for physical exercise.

Materials and methods

One of the most important problems in the therapist - patient relationship, especially at the very beginning, is that of communication, which is hindered by the patient's anxiety, ignorance, or circumstances etc.; its augmentation is vital, especially from the standpoint of interpersonal verbal communication, which is more efficient than visual or written information (Epuran, 2006).

We mention that according to the Helsinki Declaration, Amsterdam protocol and Directive 86/609/EEC, the approval of the Ethics Commission of the University of Bucharest regarding research on human subjects was obtained and also, the subjects consent for their personal participation in the research.

Research protocol

a) Period and place of the research

The data were collected during a university year (2011, september-2012, july), based on which we calculated the body mass index. The research was applied in the sport hall of the Psychomotoric Guidance Centre's.

b) Subjects and groups

Our study included 140 participants, of which 12 researchers, 52 TESA personnel and 76 academics between 24 and 60 years of age. There were 16 men and 124 women (table I).

Participants are provided with courses of maintenance gymnastics, aerobic gymnastics, fitness with appropriate devices, bodybuilding, cardio programs, table tennis, automassage, kinanthropometry, physiotherapy, and outdoor activities (hikes and nautical activities). These are included in 5 rooms that are available according to a certain program agreed upon at the beginning of the year together with the academics depending on their course schedule, in order for them to be able to incorporate in their

daily schedule time for physical activity. These courses are constantly being adapted to the individual and group according to their age, health level and training.

The time allocated for each lesson was 90 min.

c) *Tests applied*

- Researching and informing the participants with regard to their possibilities to practice and diversify the courses;

- Anamnesis;

- Counseling according to the obtained data for a program to be attended;

- Measuring somatic and functional parameters;

- Testing and evaluating physical condition levels;

- Periodic appointment and reevaluation;

- Calculating BMI = W/H²;

- Data processing using the mathematical-statistical method.

d) *Statistical processing*

We used Microsoft Excel, version 2007 to do computer graphics, process the data collected in our study, and calculation of statistical indicators and correlational analysis.

The tools provided by this software product used in our analysis are: *the arithmetic mean*.

Results

BMI was calculated for both men and women. We present in a graphical form the average BMI for women (Fig. 1 and Fig. 2) and for men (Fig. 3 and Fig. 4).

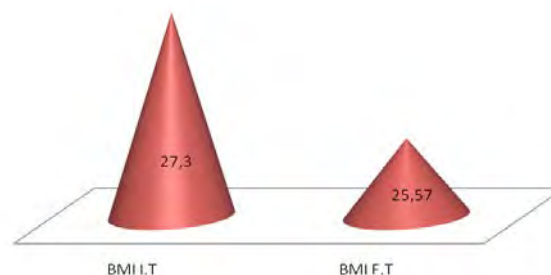


Fig. 1 - Arithmetic mean of female BMI.

Table II
Anthropometric measurement results obtained by calculating the female statistical indexes.

Women	Initial testing	Final testing
Arithmetic mean	27.29	25.54
Standard error	0.43	0.35
Median	27.77	25.54
Module	28.39	22.79
Standard deviation	4.77	3.91
Dispersion	22.81	15.28
Amplitude	20.12	18.51
Minimum	18.42	18.54
Maximum	38.54	37.05
Result sum	3357.6	3142.37
Confidence level (95%)	0.85	0.69
Variation coefficient	0.17	0.15
Total subjects	123	

Table I.

Table featuring active CCMC-UB members and the personal goals that lead them to participate in the courses.

Academics	Researchers	TESA personnel	Age	Gender M/F	Health	Discipline preference	Personal goal
65	-	-	25-54	F	V. good Good Satisfactory	fitness, tae-bo, dance, cardio, table tennis, aerobic gymnastics, kinetotherapy	- maintaining weight and physical condition; - regaining physical condition; - body remodeling; - muscle tone and general physical condition improvement; - weight loss.
11	-	-	24-60	M	V. good Good Satisfactory	fitness, dance, cardio, table tennis, aerobic gymnastics, kinetotherapy	- body remodeling; - weight loss; - relaxation; - better health; - regaining physical condition.
-	10	-	25-36	F	V. good Good	fitness, tae-bo, dance, cardio, table tennis, aerobic gymnastics	- maintaining weight and physical condition; - regaining physical condition; - body remodeling; - muscle tone and general physical condition improvement; - weight loss.
-	2	-	24-35	M	Good	bodybuilding	- health improvement and body shaping/ hypertrophy.
-	-	49	25-56	F	V. good Good	maintenance gymnastics, aerobic gymnastics, dance	- improvement in the quality of life, maintaining muscle tone and weight within optimal parameters; - obtaining a good corporal behaviour; - regaining a good physical condition; - flexibility, maintaining weight; - health improvement; - nice posture; - increasing endurance ; - maintaining a good disposition through dance.
-	-	3	24-47	M	Good	Maintenance gymnastics, fitness	- health improvement; - regaining good physical shape.

Table III

Bilateral hypothesis verification test for female test subjects.

WOMEN: Initial testing – Final testing	
Set confidence threshold	$\alpha = 0.05$
Null hypothesis H_0 (difference of the means = 0):	$m_1 - m_2 = 0$
Alternative hypothesis H_1 :	$m_1 - m_2 \neq 0$
Freedom range – df	235
t Bilateral test critical val. (t-test table val.)	1.970
Statistical Indicators	Values
Pearson correlation	0.966
t Statistic (calculated)	3.143
p ($T \leq t$) (resulting confidence threshold)	0.018

Table V

Bilateral hypothesis verification test for male test subjects.

MEN: Initial Testing – Final testing	
Set confidence threshold	$\alpha = 0.05$
Null hypothesis H_0 (difference of the means = 0):	$m_1 - m_2 = 0$
Alternative hypothesis H_1 :	$m_1 - m_2 \neq 0$
Freedom range – df	29
t Bilateral test critical val. (t-test table val.)	2.045
Statistical Indicators	Values
Pearson correlation	0.989
t Statistic (calculated)	0.402
p ($T \leq t$) (resulting confidence threshold)	0.690

In the female group, there is a -1.55% difference between the means, $p=0.018$, the calculated probability is lower than 0.05. The test is statistically relevant. The effect mass index shows a moderate to high difference between the 2 tests (tables II and III).

In the male group, there is a -0.52% difference between the means, $p=0.690$, the calculated probability is higher than 0.05. The test is not statistically relevant. The effect mass index shows a small difference between the 2 tests (tables IV and V).

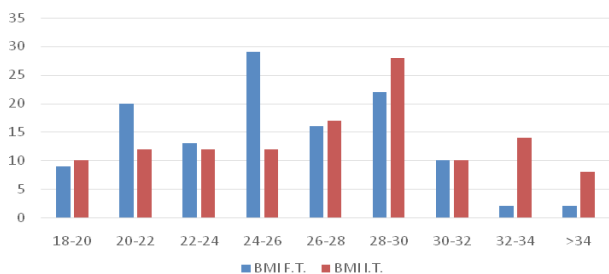


Fig. 2 – Female BMI distribution.

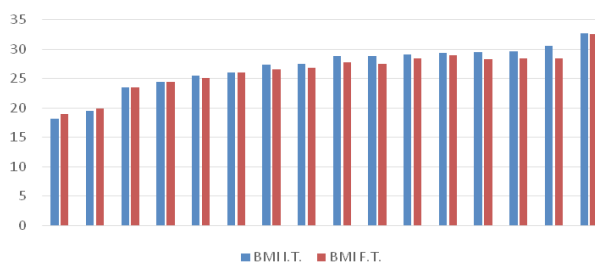


Fig. 4 – Male BMI distribution.

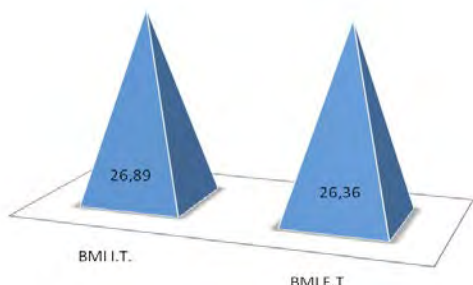


Fig. 3 – Arithmetic mean of male BMI.

Table IV

Anthropometric measurement results obtained by calculating the male statistical indexes.

Men	Initial testing	Final testing
Arithmetic mean	26.89	26.36
Standard error	0.98	0.85
Median	28.14	27.20
Module	29.34	28.40
Standard deviation	3.93	3.43
Dispersion	15.49	11.78
Amplitude	14.6	13.6
Minimum	18.13	18.95
Maximum	32.73	32.55
Result sum	430.32	421.91
Confidence level (95%)	2.09	1.82
Variation coefficient	0.14	0.13
Total subjects		16

Since it is practically impossible to maintain adiposity levels within the essential fat percentages throughout the course of life, certain charts have been created to define adiposity at a given time (Table VI). The figures refer to the adult population (aged over 25 years), based on ample US population studies, and they show clear gender (M/F) differences. Hence, they should not be referred to unconditionally, but only used as a rough guide, as it is possible for Romanian population standards to be slightly different (Dumitru, 1997).

On the grounds of the retrieved data and results it can be noted that within the year following the opening of the CCMC-UB, the number of people eager to do physical exercise levels rose, with a higher intensity in the 25-45 year old group and a lower intensity in the 46-60 year old group. The first age group, according to their personal files, seeks physical condition improvement.

The second age group seeks physical condition improvement and treatment for various diseases through kinetophysiotherapeutic programs.

According to WHO, BMI is the standard in adult weight excess risk evaluation. In the case of children and teenagers, it must be correlated with somatic growth nomograms. BMI assessment is a viable method for adults between the ages of 20 and 65. It cannot be used in the following cases: pregnant women, lactating women, muscular people (Cordun, 2009).

BMI average for our subjects is *moderately high* for women and *high* for men.

Table VI

Body adiposity assessment criteria, Dumitru (1997), after Franks and Howley (1989).

Gender	Body fat or adiposity						
	M/F	Very low	Low	Optimal	Moderately high	High	Very high
M	below 6%	6-10%	10-20%	20-25%	25-31%	over 31%	
F	below 12%	12-15%	15-25%	20-25%	30-35%	over 35%	

Discussion

The BMI of male subjects underwent small, statistically insignificant fluctuations. Individual progress was prioritized in order to attain the goals set for each subject. We believe that, considering the initial testing, the programs managed to reach their goal by the final testing, taking into account a period of accommodation and lifestyle reevaluation determined by the motives leading to psychomotor counseling.

Female subjects on the other hand had a statistically significant increase in BMI during the same accommodation and reevaluation period. The programs were also individualized and same goal groups were created, in order for a group level stimulation through mutual support to occur.

It is known that depending on age and gender (M/F) and related psychophysiological particularities, muscle mass in women makes up 27-32% of body mass, while in men, muscle mass represents up to 40-45% of body mass. The opposite is true for adipose tissue, 22-28% for women, and only 8-15% for men.

Based on psychological and psychomotor criteria, women are characterized by a good spirit of observation, good memory, manual dexterity and emotional instability (Derevenco 1998).

By their nature, women were more receptive to the indications given out and wanted to make a change in their lifestyle, always being interested in their achieved progress. This interest materialized in both individual and group results.

Conclusions

1. On the basis of the data gathered throughout the research, the proposed individualized programs performed as expected, resulting in an improvement in physical condition and overall bodily endurance, which materialized in a better disposition, ability to focus and efficiency in professional activities.

2. The programs reached their goal by their accessibility, in the first place, and by becoming structured on individual possibilities.

3. The results of the somato-functional measurements motivated the participants to follow both group and individualized programs.

Conflicts of interest

There are no conflicts of interest.

Acknowledgement

The paper presents part of the means used to fulfil sustenance and physical recovery orientation objectives, thus answering information and psycho-physical engagement needs for all the employees of the University of Bucharest.

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REVIEWS

ARTICOLE DE SINTEZĂ

Contribuții ale etnicilor evrei la dezvoltarea sportului clujean în perioada interbelică

The contribution of the Hebrew ethnics to the developments in sport in Cluj in the inter-war period

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Rezumat

Ne-am propus să studiem contribuția comunității evreiești la dezvoltarea sportului din Cluj între cele două Războaie Mondiale, având în vedere că în perioada respectivă orașul avea o numeroasă populație de evrei, care a jucat un rol recunoscut în constituirea unor structuri sportive, în conducerea acestora și obținerea unor rezultate care fac parte din tezaurul sportiv al Clujului.

În partea introductivă, lucrarea se referă la contextul în care au apărut primele organizații sportive evreiești în Europa și la participarea comunității evreiești în viața sportivă de la începutul secolului XX.

În continuare, studiul se referă la schimbările survenite în statutul evreilor din România după Primul Război Mondial și cum au influențat acestea activitatea desfășurată de etnicii evrei în mișcarea sportivă clujeană. Se face referire la constituirea și activitatea Clubului Sportiv Haggibor, sunt prezentați sportivi evrei reprezentativi pentru acea perioadă, contribuția lor la dezvoltarea unor ramuri de sport precum fotbalul, tenisul de masă, natația, gimnastica în rândul femeilor etc. Un loc important ocupă activitatea sportivă a evreilor din Cluj în condițiile politicii antisemite și a măsurilor discriminatorii luate împotriva comunității evreiești din a doua jumătate a anilor '30 și după aplicarea legilor antievreiești ale guvernului ungar, ca urmare a anexării Ardealului de Nord, care, în faza inițială, au condus la îngrădirea drepturilor de a participa la activitatea sportivă oficială, pentru ca, apoi, să ducă la desființarea cluburilor și cercurilor sportive evreiești și la distrugerea unei tradiții valoroase care făcea parte din istoria comună a clujenilor.

Cuvinte cheie: sport, istorie, evrei, Cluj.

Abstract

We aimed to study the Hebrew community contribution to sports development in Cluj between the two World Wars, since at that time the city had a large population of jews, who was instrumental in setting up structures recognized sports in their management and obtain results that are part of the treasure athlete of this city.

In its introduction, the paper refers to the context in which they first appeared in Europe Hebrew sports organizations and Hebrew community participation in the sporting life of the early twentieth century.

Further, the paper refers to changes in the status of Jews in Romania after 1st World War and how they influenced the work of the ethnic Hebrew sports movement in Cluj. Reference is made to the establishment and activity of the Haggibor Sports Club who featured jewish athletes representative for that period, their contribution to the development of sports such as football, table tennis, swimming, gymnastics etc among women. Occupies an important place in the work of the Jews in Cluj sports activity under antisemitic policies and discriminatory measures taken against the Hebrew community in the second half of the '30 and after Hebrew enforcement the Hungarian government as a result of annexation of Northern Transylvania, which, initially led to restriction of rights to participate in sport official that then lead to the dissolution of jewish clubs and sports circles, the destruction of a valuable tradition that was part of the common history of Cluj.

Key words: sports, history, Hebrew, Cluj.

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Introducere

În ultimii ani ai secolului XIX și primii ani ai secolului XX, în mai multe țări ale Europei, evreii au obținut o serie de drepturi în urma cărora li s-a oferit posibilitatea să-și asume un rol din ce în ce mai însemnat în domenii cum ar fi comerțul, industria, cultura, arta și altele (Gyémánt, 2004). Cu toate acestea, etnicii evrei, erau pe mai departe, supuși opresiunii, discriminărilor și persecuțiilor de tot felul, la presiuni pentru a-i determina să renunțe la tradiții și pentru a accepta asimilarea lor de către populația majoritară (Carmilly-Weinberger, 1994).

O seamă de tineri evrei care au studiat în universități din Austria, Elveția, Franța, Germania și Ungaria au început să militeze pentru a conștientiza pe semenii lor că pentru a putea să-și păstreze identitatea, tradițiile în condițiile acțiunilor autorităților statale de opresiune și de accentuare a procesului de asimilare forțată, sunt necesare schimbări importante în mentalitatea lor, renunțarea la atitudinea pasivă și crearea unor instituții noi care să servească aceste interese (Gidó, 2002).

Printre instituțiile prin care se viza realizarea obiectivelor legate de educarea tinerilor evrei și emanciparea acestora era și sportul. După ce în anul 1895, în Turcia, la Constantinopol, și în anul 1897, în Bulgaria, s-au constituit primele cluburi sportive evreiești, sub influența ideii lansate de Max Nordau la cel de al II-lea Congres al mișcării sioniste, ținut la Basel, în anul 1898, că sportul poate fi un mijloc eficient de întărire fizică a tineretului evreu, de educare a sa în spiritul național evreiesc, în mai multe țări din Europa Centrală și de Est au apărut numeroase cluburi sportive ale comunității evreiești: Magyar Testgyakorlók Köre Budapesta, Vívó és Athlétikai Club Budapesta, în Ungaria, Bar Kochba Berlin, în Germania, Hakoah Viena, în Austria, Haggibor Club Praga, în Boemia, Haarlem, în Olanda, Blue Star, în Elveția, Ceschie Karolinentalt, în Slovacia etc. Denumirile acestora, în cele mai multe cazuri, aminteau de eroismul și trecutul glorios al poporului evreu, iar sportivii concureau într-un echipament ce avea o simbolistică aparte, culoarea alb-albastră, steaua lui David pe tricouri (Adorjan, 1922).

Chiar dacă în perioada de dinaintea Primului Război Mondial în Cluj exista o comunitate evreiască numeroasă, bine reprezentată în multe domenii de activitate, nu s-au întrunit condițiile pentru constituirea unui club sportiv al acesteia. În schimb, mai ales tinerii evrei proveniți din comunitatea neologă, reformată fundamental prin opera lui Moses Mendelssohn (Heine, 1996), care datorită educației au abandonat o serie de norme tradiționale în care izolarea juca un rol important și au adoptat un mod de viață laic, specific unei urbe cosmopolite care era Clujul în acea perioadă, s-au integrat ușor în structurile sportive aflate în formare, mai ales că statutele acestora nu le îngrădea accesul. Structurile sportive din acea perioadă aveau la bază dictonul lui Juvenal „Mens sana in corpore sano”, care era departe nu numai de spiritul antisemit, ci și de cel exclusivist. Chiar dacă nu s-au păstrat documente privind apartenența etnică a membrilor cluburilor și cercurilor sportive din acea perioadă, putem presupune că mulți tineri evrei au făcut parte din acestea. De asemenea, în perioada de început a sportului clujean, mulți etnici evrei au avut

un rol important în constituirea unor structuri sportive, mai ales a grupărilor în care calitatea de membru era condiționată de apartenența la o anumită profesie.

Perioada de după constituirea României Mari

Schimbările care au avut loc după unirea Transilvaniei, Banatului, Crișanei, Maramureșului, Bucovinei și Basarabiei cu Regatul României au avut influențe majore și asupra populației evreiești din Cluj. În primul rând, pe baza Tratatului asupra Minorităților semnat de guvernul român cu Puterile Aliate, foștii locuitori ai Imperiului Austro-Ungar cu domiciliul în Cluj au devenit cetățeni ai unei alte țări, cu tot ce implica aceasta (Stoenescu, 1998).

După înființarea, la 20 noiembrie 1918, la Cluj, a Asociației Naționale a Evreilor din Transilvania, prima organizație a minorității evreiești din Transilvania și Banat recunoscută în mod oficial de către guvernul României (1), reprezentanții de frunte ai populației evreiești din localitate au încurajat realizarea unui cadru instituțional care să promoveze statutul de minoritate națională recunoscută (Eisenberg, 1993). În acest context, fruntașii mișcării sioniste din Cluj, la fel ca cei din principalele orașe din Transilvania, au desfășurat o laborioasă activitate pentru ca sportul să fie folosit pentru adoptarea unui mod de viață sănătos, ca mijloc de educare a tineretului, de propagandă pentru trezirea conștiinței naționale a evreilor (Fehér, 1937). Astfel, începând cu anul 1920, cu sprijinul comisiilor culturale sioniste din cadrul Federației Transilvania și Maramureș, alături de organizațiile existente deja pe linie culturală, religioasă, profesională, asistență socială, cele caritabile, ale femeilor și tinerelor israelite și altele, s-au constituit și primele asociații sportive, bazate pe apartenența la comunitatea evreiască.

În această perioadă Clujul era unul dintre orașele din România cu un mare număr de etnici evrei, 18.062, după Recensământul din 1930, (3) care prin activitatea lor au făcut ca orașul să reprezinte principalul centru al evreilor transilvăneni. Cu sprijinul organizației sioniste din oraș, la 22 martie 1920, la inițiativa scriitorului Giszkalai János, a medicului Knöpfler Bernat și a avocatului Weinberger Chain, a luat ființă prima grupare sportivă evreiască din Transilvania, Haggibor Cluj (1).

Imediat după înființare s-a trecut la asigurarea condițiilor pentru desfășurarea activității. S-a constituit Societatea Arenei Sportive Haggibor, Societate Anonimă, al cărui acționar principal era inginerul Horosz Iuliu, care a achiziționat un teren de 5 jugăre cadastrale și 1044 stânjani pătrați, echivalentul a 3,2530 ha, în cartierul Andrei Mureșan-Sud. În acest spațiu s-a amenajat o bază sportivă, care a funcționat între anii 1920-1930 (Loneanu, 2011).

Prin formarea, la 22 decembrie 1922, a filialei Transilvania a Uniunii Mondiale Maccabi și afilierea la Uniunea Mondială Maccabi, organism internațional în care erau reprezentate toate cluburile sportive evreiești din lume, mișcarea sportivă în rândul evreilor a cunoscut un progres sub aspect organizatoric.

În grupările sportive clujene din perioada interbelică au activat o seamă de sportivi evrei care au făcut parte din loturile naționale ale României. Printre aceștia s-au numărat fotbalistul Jakobi Dezső, scrimerii Deutsch Fülöp, Schwartz Ludovic, Erős Vilmos, jucătorii de tenis de masă

Paneth Farkas, Diamandstein Erwin, Goldberger Marin.

Dezső Jacobi a fost cel mai bun mijloc al echipei naționale a României în perioada 1921-1924. El a făcut parte din prima reprezentativă a României care, în anul 1921, a jucat primul său meci oficial, cel din Cupa Regelui Alexandru I, cu reprezentativa Iugoslaviei. A jucat cinci meciuri în reprezentativa României (2). A făcut parte din lotul care a reprezentat România la turneul de fotbal din cadrul Jocurilor Olimpice de la Paris, 1924. Un accident nefericit i-a întrerupt prea devreme cariera sportivă (Moises, 1969).

Paneth Farkas, sportiv al clubului Haggibor, a fost unul dintre cei mai buni jucători de tenis de masă din România în perioada interbelică. A făcut parte din echipa reprezentativă a României care a obținut medalia de argint, la proba pe echipe (Goldberger Marin Vasile, Pop Pitu, Farkas Paneth, Vladone Victor și Diamandstein Erwin) în cadrul Campionatelor Mondiale de la Praga, 1936. A fost component al echipei României, clasată pe locul VIII la Campionatele Mondiale de la Baden bei Wien, 1937. S-a clasat pe locuri fruntașe în mai multe ediții ale campioanelor regionale Cluj, 1932, 1933. A fost campion național, la proba pe echipe, în 1934, 1935. S-a clasat pe primul loc în Cupa României în edițiile 1934/1935, 1935/1936. În anul 1937 s-a clasat pe locul II în proba de simplu la campionatele naționale (Paneth, 2003).

Ca urmare a actelor normative ale autorităților române îndreptate împotriva evreilor, cariera sa a avut de suferit. A fost înlăturat din echipa națională și i s-a suspendat dreptul de a participa la activitățile sportive. După finalizarea anexării Transilvaniei de Nord de către Ungaria, prin aplicarea legilor antievreiești ale guvernului de la Budapesta, Paneth a fost trimis la muncă forțată la Baia Mare, pe frontul din Ucraina, la Cracovia și, în final, deportat în lagărul de exterminare de la Auschwitz (Rosenfeld, 2002).

În perioada interbelică fotbalul a fost printre ramurile sportive practicate în număr mare de etnicii evrei din Cluj. În primii ani de activitate, Clubul Haggibor a funcționat cu o singură secție, cea de fotbal. Haggibor s-a numărat printre echipele de fotbal care au participat la primul campionat local al Clujului organizat după formarea României Mari, competiție câștigată de echipa etnicilor evrei (Fărcaș și Stanciu, 2012).

Echipa de fotbal a Clubului Haggibor a fost, aproape două decenii, printre grupările care au evoluat în cadrul campionatului regional Cluj și, apoi, cel de district (***, 1920). În componența echipelor de fotbal clujene au fost numeroși jucători proveniți din rândul comunității evreiești. Cei mai cunoscuți dintre aceștia au fost: Jacoki Dezső, component al reprezentativei României și al echipei olimpice care a participat la turneul de fotbal din cadrul Jocurilor Olimpice de la Paris, 1924 și Rosenberg, portar format la Cluj și transferat la Hakoah Viena. Printre fotbaliștii valoroși din acea perioadă s-au numărat Jakobi Ernest, Raab Miklós, Erős Vilmos, Radó Ernests, Hirsch Elemér, Deutsch Pavel, Rosenfeld-Trandafirescu II.

În anul 1933, în reprezentativa de fotbal a evreilor din România, care a ocupat locul II la Olimpiada Evreiască de

la Praga, au fost incluși și jucători din Cluj (***, 1933).

Atletismul clujean a beneficiat de aportul unor sportivi din cadrul comunității evreilor clujeni, precum Morariu Vasile, Morariu Alexandru, Andor Imre, Ludovic Schwartz.

Începutul practicării tenisului de câmp de către membrii comunității israelite din Cluj datează cu mult înaintea constituirii clubului Haggibor. La sfârșitul secolului XIX tenisul de câmp era larg răspândit între etnicii evrei. În perioada interbelică, în secțiile de tenis din Cluj, care erau printre cele mai puternice din România, au activat numeroși etnici evrei. Cei mai valoroși jucători de tenis din rândul comunității evreiești au fost Radó Ernests, Diamant Ladislau jr., Havas Ferenc, Rosemberg György, Hirsch Ernests. Dintre jucătoarele de tenis s-au remarcat Goldstein, Havas, Weiss și Schultz. Una din cele mai prestigioase turnee de tenis desfășurate în România în perioada interbelică a fost cel organizat de Clubul Haggibor. Printre participanți s-au numărat competitori din Ungaria și din cele mai cunoscute centre de tenis de la noi din țară, Arad, Oradea, București și Cluj (Voia, 1987).

Comunitatea evreilor din oraș a avut un aport recunoscut la dezvoltarea natației, în mod deosebit a jocului de polo. În anii 1920 Haggibor a fost una dintre cele mai bune echipe de polo din Cluj. Evreii clujeni au contribuit la dezvoltarea natației și prin punerea la dispoziția iubitorilor sporturilor în apă a bazinului de înot acoperit din proprietatea comunității și a celui în aer liber de la arena Haggibor, din cartierul Grigorescu-Donath.

Comunitatea evreilor din Cluj, prin Clubul Sportiv Haggibor și Asociația Femeilor Israelite, a contribuit și la promovarea sportului în rândul femeilor și tinerelor fete, în mod deosebit a gimnasticii de întreținere ca mijloc de formare în rândul acestora a unor deprinderi de practicare a exercițiilor fizice, ca modalitate de dezvoltare fizică armonioasă, de emancipare, de schimbare a opticii privind femeia, a rolului ei în comunitate, importanța sănătății ei pentru familie. În aceste acțiuni un rol important au jucat cele două săli amenajate, la început în sediul din Andrei Mureșanu-Sud și, apoi, în complexul sportiv Grigorescu-Donath (Loneanu, 2013).

Printre sporturile practicate în care tinerii evrei s-au remarcat și au avut rezultate în competițiile locale, regionale și cele naționale a fost și scrima. Schenker Ludovic s-a numărat printre antrenorii de scrimă clujeni recunoscuți pentru valoarea lor profesională și rezultatele obținute de sportivii pregătiți de el.

În perioada de început a tenisului de masă din România, la fel ca în multe alte orașe din Transilvania, Banat, Crișana și Maramureș, etnicii evrei din Cluj au avut un rol important în implementarea, promovarea și dezvoltarea acestui sport în rândul copiilor, tinerilor și a celorlalți locuitori ai orașului. Totodată, unii dintre ei s-au numărat printre sportivii de frunte pe plan național. Goldberger Marin Vasile, Paneth Farkas, Diamandstein Erwin au fost componenți ai echipei reprezentative a României care, la Campionatele Mondiale de la Praga, 1936, la proba pe echipe, a obținut medalia de argint. De asemenea, acești sportivi au obținut rezultate valoroase în întrecerile individuale, probele de dublu și pe echipe pe plan intern (Paneth, 2003).

Măsuri care au condus la restrângerea și, apoi, desființarea sportului în rândul etnicilor evrei

În condițiile afirmării în România a forțelor fasciste și transferarea, tot mai mult, a măsurilor și acțiunilor antisemite în sfera politicii de stat (Gyémánt, 2004) și în domeniul sportului s-au elaborat și aplicat mai multe acte normative îndreptate împotriva etnicilor evrei. Prin Decizia Uniunii Federațiilor Sportive din România, din 30 martie 1935, privind stabilirea și la nivelul mișcării sportive a unei proporții între români și minoritari, a fost afectată componența grupărilor sportive, a loturilor reprezentative ale României. Cea mai cunoscută situație din sportul clujean a fost a jucătorului de tenis de masă Paneth Farkas, care a fost exclus, pe motive rasiale, din reprezentativa României, care participa la Campionatele Mondiale de la Cairo (Borbely, 2002).

Odată cu intrarea în vigoare a Decretului-Lege nr. 3424 din 7 octombrie 1937, Straja țării a dat o serie de directive privind românizarea treptată a sportului de elită prin înlocuirea antrenorilor străini și a celor aparținând minorităților, cu specialiști români.

Sportul în rândul etniei evreiești a fost afectat în mod serios în urma Deciziei nr. 72 din 6 august 1940 emisă de Straja Țării, act normativ transmis prin Decretul-Lege nr. 2650 din 8 august 1940 prin care cluburile sportive care nu se compun în majoritatea lor din cetățeni români creștini sunt desființate. Astfel, începând cu data de 8 august 1940, Clubul Haggibor Cluj a fost șters din controale, secțiile sale pe ramură de sport radiate și sportivii acestora au fost scoși din evidențele comisiilor regionale sau ale federațiilor de specialitate (Angelescu și Cristea, 2009).

Situația sportivilor evrei din Cluj s-a înrăutățit și mai mult după ce Transilvania de Nord a fost alipită Ungariei. Prin aplicarea legilor antievreiești din 28 mai 1938 și 5 mai 1939, care deja erau în vigoare în Ungaria, a fost îngrădită activitatea tuturor structurilor sportive evreiești și mulți sportivi bărbați din cadrul acestora au fost încorporați forțat în batalioane de muncă și deportați (Mózes, 1995).

După hotărârea guvernului ungar de la începutul lunii august 1941, prin care a fost suspendat dreptul etnicilor evrei de a participa la activitatea sportivă oficială, la câteva luni, în baza articolului 2.3 din Decretul-Lege nr.239.000/1942, nici o persoană de etnie evreiască, considerată ca atare în baza punctului 9 a Hotărârii XV a Guvernului Ungariei, nu putea fi membru a unei structuri sportive (Neumann, 1996). În temeiul acestui act normativ, treizeci și două de cluburi și asociații sportive constituite pe criteriul apartenenței la etnia evreiască, printre care și Haggibor Cluj, au fost desființate (Kiss și Szegedi, 2005). În acest fel, s-a pus capăt unei tradiții valoroase în formare, care era parte componentă a patrimoniului comun al clujenilor.

Concluzii

În anii dintre cele două războaie mondiale, comunitatea evreilor din Cluj s-a dovedit a fi iubitoare a sportului. Această afinitate s-a manifestat atât prin numărul mare al ramurilor de sport practicate, sportivii legitimați, prin activitatea conducătorilor pentru dezvoltarea sportului și organizarea unor competiții, cât și prin sprijinul acordat sub

forma donațiilor, a cotizațiilor și a altor forme de finanțare.

Comunitatea evreilor clujeni s-a evidențiat prin contribuția la amenajarea unor baze sportive, în mod deosebit la cele două complexe din cartierele Andrei Mureșan-Sud și Grigorescu-Donáth.

În prima jumătate a secolului XX, în programul de emancipare, de adaptare la cerințele perioadei respective, în cadrul eforturilor pentru păstrarea și promovarea identității naționale a evreilor clujeni, structurile sportive, alături de o seamă de organizații laice și biserice, a jucat un rol recunoscut.

În perioada de început a sportului clujean, etnicii evrei, împreună cu ceilalți locuitori ai urbei, au contribuit la înființarea unor structuri sportive, la dezvoltarea mișcării sportive a orașului.

Clubul Haggibor, ca structură sportivă a comunității evreilor din Cluj, a jucat un rol important în educarea membrilor săi în spiritul sportiv și în conducerea, organizarea și derularea activității sportive a evreilor clujeni, precum și în promovarea ideilor sioniste.

Evreii clujeni au avut o contribuție recunoscută în implementarea și promovarea jocului de polo și a tenisului de masă în rândul tinerilor și a altor locuitori ai orașului.

Cu sprijinul organizației femeilor și tinerelor fete israelite, a organizațiilor de tineret din cadrul comunității, în cercul de gimnastică s-a militat pentru emanciparea femeilor și tinerelor, pentru formare în rândul acestora a unor deprinderi de practicare a exercițiilor fizice ca modalitate de dezvoltare fizică armonioasă, de educare a tinerelor, schimbare a opticii privind femeia, a rolului ei în comunitate, importanța sănătății ei pentru familie.

Prin măsurile restrictive luate de autoritățile române în a doua jumătate a anilor '30 privind sportul în rândul evreilor, dar mai ales în urma aplicării, după anexarea Transilvaniei de Nord, a legilor antievreiești ale guvernului ungar au fost suspendate drepturile populației israelite de a lua parte la activitățile sportive oficiale, iar, apoi, structurile sportive ale evreilor au fost desființate.

Prin contribuția la constituirea unor structuri sportive, prin participarea la viața sportivă a orașului, prin sportivii promovați în reprezentativele naționale ale României, prin participarea și rezultatele obținute în competițiile locale, regionale și cele naționale, comunitatea evreilor clujeni a realizat o tradiție valoroasă ale cărei componente fac parte din patrimoniul comun al locuitorilor orașului.

Conflicte de interese

Nimic de semnalat.

Precizări

Articolul face parte dintr-un ciclu privind rolul etnicilor evrei în dezvoltarea sportului din Transilvania. Prin lucrarea de față, dorim să scoatem în evidență contribuția acestei etnii la dezvoltarea sportului în orașul Cluj, în perioada dintre cele două războaie mondiale.

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Verbal and non-verbal communication in sports culture **Comunicarea verbală și nonverbală în cultura sportivă**

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Abstract

Evolution is achieved by the individual's own development in which heredity, environment and education are considered as an influencing mechanism that marks human advancement.

Ontogenetically, non-verbal communication shows a large precocity, based on innate elements (reactions that are determined by emotions, for example), but also learned elements. On the other hand, it can be an independent form of self-contained communication too, with specific objectives (dance, pantomime, sport, etc.) as well as "betraying" the individual's socio-cultural area.

Practicing physical exercises contributes to an ability in forming movements, not only controlling them but also using them for action and expressivity. In sport, the expressive movements of "difficulty", "exercise", induce to the viewer a sensation of discomfort and inadequacy to the task.

In physical education and sport activity, the word is used by the teacher and student in different situations, with special intentions and methods of addressing.

Also, in sport, motor learning is achieved through directed and self-directed communication, (internal and self-regulated by the athlete) and usual learning is achieved through a more complex use of verbal means.

An athlete's attitude can be "read" from their posture and facial expressions (example, looking away/down or lack of attention shows indifference or boredom; raised eyebrows show lack of confidence, a brisk walk with the head up indicates self-confidence, a seated position with legs apart indicates relaxation, opening, tilted head while listening reveals interest, an explanation with open palms indicates sincerity etc.). These gestures should not be interpreted separately from other gestures or circumstances, but must be taken together and correlated with the situation as a whole.

Key words: language, non-verbal language (body language), non-verbal communication.

Rezumat

Evoluția individului se realizează după legități proprii, în care ereditatea, mediul și educația se constituie ca mecanism de influențare, ce își pune amprenta asupra devenirii umane.

Ontogenetic, comunicarea nonverbală prezintă o mare precocitate bazată pe elemente înnăscute (reacții determinate de emoții, de exemplu), dar și învățate. Pe de altă parte poate fi o formă de comunicare de sine-stătătoare, cu obiective specifice (dans, pantomimă, sport etc.), precum poate „trăda” aria socio-culturală a individului.

Practicarea exercițiilor fizice contribuie la formarea capacității de efectuare a mișcărilor, de stăpânire a lor și utilizarea nu numai acțională, ci și expresivă. În sport mișcărilor expresive de „dificultate”, „efort”, induc la privitor senzația disconfortului și neadaptării la sarcină.

În activitatea de educație fizică și sport cuvântul este folosit în diferite situații, cu adrese și intenții deosebite, atât de profesor, cât și de elev.

Totodată în activitatea sportivă, învățarea motrică se realizează printr-o comunicare condusă, dar și autocondusă (limbaj intern și autoreglator al sportivului), iar la nivelul învățării obișnuite se realizează printr-o utilizare mai complexă a mijloacelor verbale.

Atitudinea sportivilor poate fi „citită” din posturile și expresiile lor faciale (exemplu, privirea în gol/în jos sau nepăsare, denotă dezinteres sau plictis; sprâncenele ridicate indică neîncredere; un mers vioi, cu capul drept indică încredere în sine, o poziție de tipul așezat, cu picioarele depărtate indică destindere, relaxare, deschidere; capul înclinat atunci când ascultăm denotă interes, o explicație cu palmele deschise indică sinceritate etc.). Aceste gesturi nu se pot interpreta separat de alte gesturi sau de circumstanțe, ci trebuie să fie privite în ansamblu și corelate cu situația ca întreg.

Cuvinte cheie: limbaj, comunicare nonverbală, limbaj nonverbal.

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Introduction

In this paper, we aim to develop a quite heterogeneous topic that is equally risky if we keep in mind that non-verbal communication is considered to be “land shaking”.

Evolution is achieved by the individual's own development in which heredity, environment and education are considered to be an influencing mechanism, which has an impact on human advancement. The notion of “communication” comes from the Latin “*communis*”, which means “to agree”, “to be connected to” or “being in a relationship”, although in the ancient vocabulary the term means “to communicate to others “,” to share something to others”.

Some specialists reduce the definition to a simple classification: notification, news, relationship, rapport, connection; synonyms which are provided by the dictionary.

Society continues to exist by transmission, by communication, but it would be correct to say that it exists in transmission and communication. There is more than a verbal connection between words, as expressed by *common, community, communication* (Cergit I).

People live in community by virtue of what they have in common, and communication is the way in which they come to possess things in common. To form a community or society, they must have common goals, beliefs, aspirations, knowledge, a common understanding, “same spirit” as sociologists say.

Communication is performed on three levels: logical, para-verbal and non-verbal.

The logical level (words) represents only 7% of all communication levels, 38% of communication occurs at a para-verbal level (tone, volume, rate of speech, etc.) and 55% is non-verbal (facial expression, position, movement, clothing, etc.).

Verbal and non-verbal communication in sport

Communication between individuals and groups is very important and useful; it helps to form the personality as it allows the transmission of social experience. In terms of expression means, communication is divided into verbal and non-verbal. The second category is a sphere driven more by culture than by company and is often highly localized.

Communication may be positive and negative; to obtain positive communication, the coach is required to have knowledge outside his area of expertise, such as psychology, pedagogy, anatomy, biomechanics, etc. This is necessary because athletes are different intellectually and emotionally, and the coach as the team leader must be clearly understood by all athletes. If this is not done, misunderstandings may occur, which can seriously affect individual and group performance, creating tension, so that the goals will not be achieved (Atkinson P). It has also been shown that positive expressions (“You can do it”, “Do not quit, it will be fine”) used by the coach in training or competitions often increase efficiency. All are part of verbal communication that is important in sports training.

The types of communication used by coaches and physical education teachers are:

- Intrapersonal communication - communication with oneself.
- Interpersonal communication - communication between people (teacher-athlete).
- Group communication - communication between the members of a group and communication of the group with other people.
- Mass communication - communication received or used by a large number of people.

The meaning of communication in sport

Ontogenetically, non-verbal communication has a great precocity based on innate elements (reactions caused by emotions, for example), but also learned elements. On the other hand, it can be a form of self-contained communication with specific objectives (dance, pantomime, sports, etc.) and can “betray” the individual's socio-cultural area.

In verbal communication, the conscious sphere is largely involved, while non-verbal communication is spontaneous, less censored, unaffected by distortions. In sports, expressive movements of “difficulty”, “effort” induce to the viewer the feeling of discomfort and inadequacy to the task.

Movement communication skills manifest in social life, genetic psychology has shown the importance of communication through movement in children, especially in the pre-operational stage, when they want to express and communicate something.

Research has shown that eye, face and body movements are generally more revealing for the emotions and feelings concerned.

By communicating, we use a specific vocabulary and specific terminology, so that human communication through words is qualitatively conditioned by the volume of the vocabulary used and received. In adult communication, the transmission capacity is lower than the receiving capacity, while in the educational process students understand more words than they can express.

For example, the teacher announces the task as a verbal motor task (command, indication, etc.) often using specific technical terminology, (bending, leaning, tilt, roll, ball, etc.), words with precise meanings to describe these acts. Students understand what they are told, but they cannot use the same vocabulary if asked.

We mention some principles that stand out: issue causes reception, the message travels from one predominantly active pole (the teacher in the teaching process) to a passive receiver; the communication chain has a linear direction, the present steps automatically determine the future ones without reciprocity, etc. (H. Gardner).

The current focus is mainly on oral communication research, long neglected because of the lack of technical tools that capture communication in its complexity.

In physical education and sports activity, the word is used by both teacher and student in different situations, with special intentions and methods of addressing.

The main forms of communication specific to coaches (teachers) are: direct order, suggesting the action, discussion-communication, lecture, demonstration and analysis.

In sports, motor learning is achieved through directed

and self-directed communication (internal and self-regulated by the athlete) and usual learning is achieved through more complex verbal means. Learning situations are very numerous, and the execution and performance are very different from one class to another, and even from one student to another.

The teacher will transmit knowledge and guidelines, orders, encouragement regarding the execution of the motor acts. On the other hand, the student will “dialogue” with the teacher, trying not only to perform, but also to relate how and what he did, what and how the next attempt will be, he will assess his own performance and program new forms of movement. To describe the meaning of communication that we use daily, the following three terms are used:

a) The communication forms, which are ways of communication such as speaking, writing or drawing, are distinct and separate, each having their own messaging system. So, when signs are marked on the paper according to certain rules (grammar and spelling), words and “forms” are created in writing.

b) The communication environment is a means of communication that combines many forms. The environment may use technology that is beyond our control, for example, a book is an environment that uses forms of communication such as words, pictures and drawings.

c) The media are the mass communication means, such as radio, television, magazines etc.

In all sports, non-verbal communication exists and is specific to each individual, as evidenced by the codes, signs, drawings, etc. established between coaches and athletes, and between athletes. However, it can be stated that there are no “pre-established laws” like in verbal communication.

A frowning face of the coach, head signs of disapproval, and others generally have a powerful effect on athletes. A sign of approval or positive facial mimicry from the coach at the right time can give the athlete the extra energy needed to win a competition, even when he is in a physically critical moment.

The knowledge and understanding of technical terms by the athlete can greatly ease the coach’s job. A proper awareness of one’s own training and especially one’s own body combined with the desire to win can greatly facilitate communication between the athlete and the coach (De Vito).

This communication between the athlete and the coach is good and represents a balance in the athlete’s life because the athlete is often physically and mentally abused during training and competitions in addition to other problems: injuries, family problems, etc. For these reasons, the coach must have an understanding capacity and expression superior to those of the athlete. We know that there are coaches who mentally terrorize their athletes with expressions such as “you are good for nothing”, “trouble maker”, etc. In the long term, this attitude may cause mental damage to the athlete, most often leading to giving up on high performance sport.

Most athletes start with a desire to gain fame, which may “darken” their judgment at times. For this reason, knowing some psychology elements may help the coach

“refine” these feelings by implementing moral principles, fair play.

The athletes’ attitude can be “read” in postures and facial expressions (gazing into space, looking down show indifference, disinterest or boredom, raised eyebrows indicate distrust, a brisk walk with the head up indicates confidence, sitting with legs spread indicates relaxation, opening, listening with tilted head shows interest, an explanation with open palms indicates sincerity and so on). These gestures should not be interpreted separately from other gestures or circumstances, but must be taken together and correlated with the situation as a whole.

Methods and means for developing non-verbal communication skills in physical education classes

So far body expression, in conjunction with intellectual aspects, moral and psycho-affective-volitional, with facial expression as a support, has been included in the stage movement discipline as an objective for the completion of the actor’s art (Isac Carmen Aneta).

Conceptually, body expression is a study discipline, with an artistic function based on the fact that it interferes with various arts: music, dance, theater, painting, sculpture, and various branches of gymnastics in establishing plasticity forms in correspondence with music.



Fig. 1 – Theme: “In the mirror”.

Each lesson comprises different objectives and contents, gravitating around five main methods: warming up, combining different techniques and movements, structural improvisation, structuring and demonstrating the structure.

In school, for developing non-verbal communication skills, we can use rhythmic themes, gymnastic elements, dance, mimic and pantomimic elements.



Fig. 2 –Theme: ”Butterfly”.

We present an example of a lesson:

a) *Organizing the collective of students*

Lesson sequence organized to ensure the beginning of the lesson. To capture the students' attention and interest we can use rhythmic themes and music games (5 minutes).

b) *Preparing the body for effort*

Gradual stimulation of morphological and functional indices ensuring an optimal excitation condition, using different means for developing coordination:

- Spatial-temporal orientation (5 minutes each lesson);
- Motor rhythm (5 minutes);
- General coordination (5 minutes);
- Forming the basis of the general aesthetic movement (7-8 minutes each lesson).

Recommended means

- Complex structures varying paces in different tempos, ranging from walking to running in different directions and at different signals;

- Rhythmic and musical games, which can be used both indoors and outdoors.

c) *Influencing the motor system*

This lesson sequence is very important, it has a formative value especially in primary and secondary schools (10 minutes each lesson).

Recommended means

- It addresses at the same time aesthetic education;

- Eurhythmy specific exercises such as mimicry will be used (expressiveness, facial mobility), means of expression through gesture and attitude, mime, dance expression);

- Complex structures for aesthetic education;

- Complex structures to optimize harmonious physical development (development of joint mobility and elasticity), optimizing muscle tone (alternating contraction and relaxation), developing intersegment coordination.

d) *Developing specific motor skills*

- Developing mobility, speed, strength, springing (20-25 minutes each lesson);

- Learning, consolidating and improving motor skills.

Consolidation lessons will aim to strengthen and stabilize the skills and capacity to associate different movements and to adapt them to different situations and even to music.

e) *Relaxation (2-3 minutes each lesson)*

- We can use eurhythmy for different variations of steps, slow movements that engage the whole body into stretching movements etc.;

- Among training methods we used verbal communication methods (when themes were presented), practicing, questioning.

The teacher's role is to accurately capture and discover all the relevant factors in relation to commands. Everything is possible around a theme, provided that the base picture is respected.

The teacher plays a role in making the student manifest sensitivity, so that every gesture matches one's content, abstract and personal at the same time.

Here a dual principle is present, which is important in the bipolar body-imagination relation; on the one hand, the teacher focuses attention on the gesture to make it meaningful for the subject, and on the other hand, on mental representations and sensations according to each gesture

phases. Orders raise the student's personal imagination, as the concepts are abstract and precise, the individual possibilities are opened.

The teacher should organize learning around this major concept for the student to build, structure, and make visible and distinctive an image.

Examples of general themes:

- Exploring verticality, horizontality;
- Indicating the notions up, down;
- Drawing paths in any space (three-dimensional);
- Opening, closure;
- Playing with the notion of rhythm, based on the theme.

Conclusions

1. A good communication can lead to increased performance of an athlete or team, being one of the main elements of performance; a good coach-athlete communication makes the road to high performance easier and pleasant.

2. Physical education and sport teachers can "awake" in students the love for practicing sports.

3. Judgment, individuals and society are not discrete structures, but personal and interpersonal interaction processes. Symbolic interaction emphasizes the importance of language as a fundamental mechanism in becoming aware and judgmental. Personality is what is proper and a distinguishing characteristic of each person as an individual, in their own way.

4. The art of communicating is not a natural process or a skill with which we are born; we learn to communicate, so we must study what we learn, so we can use our knowledge more effectively.

5. Any communication involves creation and exchange of meanings; these meanings are represented by "signs" and "codes". It seems that people have a real need to "read" the meaning of all human actions.

6. Observing and understanding this process can make us more aware about what happens when we communicate.

Conflicts of interests

Nothing to declare.

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Book reviews Recenzii cărți

Developing Sport Expertise. Researchers and Coaches Put Theory into Practice – second edition

(Dezvoltarea expertizei în sport. Cercetătorii și antrenorii pun teoria în practică – a doua ediție)

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Dezvoltarea unui sportiv, de la nivelul de începător și până la condiția de competitor de elită, reprezintă un proces complicat și de durată. În acest proces, este clar, identificarea cât mai timpurie a celui efectiv talentat, și capabil de a urma drumul greu, lung, plin de sacrificii și adesea de neprevăzut, de întâmplări nefavorabile constituie primul pas, prima condiție, obligatorie dar nu suficientă, întrucât doar ceea ce urmează poate să convertească talentul în performer, speranța în confirmare. Iar ceea ce trebuie să urmeze înseamnă asigurarea condițiilor pentru o devenire naturală, fără sincope, a celui destinat mării performanțe. Mai concret, pentru a putea participa și face față la miile de ore de antrenament, în vederea achiziționării deprinderilor specifice sportului respectiv până la etapa perfecțiunii; iar după aceea, pentru menținerea la vârful performanței, pe parcursul cât mai multor ani. Printre aceste condiții *sine qua non* se numără, bineînțeles, și șansa de a lucra sub directa îndrumare a unor antrenori de valoare, completați de o echipă redutabilă de profesioniști ai principalelor științe ale sportului.

Problema care se ridică, însă, este de unde atâția antrenori și specialiști valoroși și dedicați, încât șansele copiilor foarte talentați să-i întâlnească, să fie reale. Și, mai departe, cine și în ce fel trebuie și poate să aibă grijă ca antrenorii să devină din ce în ce mai buni, iar cei ajunși la o competență foarte înaltă să nu cadă în autoadmirație și automulțumire, să nu se plafoneze, ci să fie în permanență preocupați de a-și îmbogăți și actualiza cunoștințele și, de ce nu, de a contribui ei înșiși la formarea de antrenori de elită. Această problemă a „producției” de antrenori capabili să convertească pe cei talentați în valori sportive de

vârf, este din păcate tratată rutinier, fără prea multă imaginație. Toată lumea din sport este obsedată și își propune „să scoată” sportivi mari, dar formarea antrenorilor de valoare nu preocupă în mod obstinat și aplicat pe cei care pot cu adevărat face ceva în această privință, considerându-se că acele banale și plictisitoare cursuri de perfecționare, pe care toți participanții le absolvă, dacă plătesc taxa de înscriere, ar fi suficiente. Situație în care singurul mod de perfecționare și creștere valorică reală a antrenorilor, rămâne interesul și consecvența lor de a o face, cu condiția accesului la surse de încredere de informare-formare continuă. O astfel de sursă o reprezintă prezenta carte, care - așa cum o arată și titlul - vizează dezvoltarea excelenței în sport, prin transferul teoriei în practică, de către cercetători și antrenori de vârf ai ultimelor decenii.

Ideea, impulsul inițial al redactării primei ediții a acestei lucrări, s-a cristalizat în cursul unui workshop - intitulat „Expertiza și învățarea în sport” - organizat în 2005 la Institutul Australian pentru Sport. La acest workshop au luat parte antrenori și sportivi, dar mai ales cercetători și teoreticieni ai științelor sportului. Participanților invitați cu anumite prezentări, li s-a sugerat ca atunci când își pregăteau materialele să aibă în vedere contribuția cercetărilor și ipotezelor lor, ♦ la dezvoltarea și perfecționarea sportivilor, antrenorilor și oficialilor de elită, ♦ la optimizarea antrenamentului de performanță și ♦ la programele de identificare a talentelor pentru sport.

Interesul pentru expertiză și excelență în general (în artă, în afaceri etc.) a atins un evident boom în perioada în care a apărut prima ediție a prezentei cărți, și imediat după aceea. Dovadă și succesul formidabil a două cărți de psihologie a succesului: „Excepționalii. Povestea succesului”, de Malcolm Gladwell, apărută în 2008, respectiv „Cifrul talentului”, de Daniel Coyle, 2009. Pe de altă parte, de la apariția primei ediții a lucrării de care ne ocupăm, în 2008, s-au înregistrat importanți pași înainte - atât în plan teoretic, cât și în cel practic - în mai multe dintre domeniile abordate în cuprinsul său, iar progresele tehnologice semnificative au făcut posibile substanțiale îmbunătățiri, în special în ce privește metodologiile de măsurare/testare/evaluare a sportivilor. În aceste condiții, o revizuire-completare și actualizare a conținutului ei s-au impus cu stringență, misiune asumată de cei trei editori, ajutați de o echipă redutabilă, formată din 36 contribuitori; pe de o parte specialiști de vârf ai științelor sportului, iar pe de altă parte antrenori de clasă mondială în diverse sporturi. În felul acesta fiind asigurată atât de necesară - și adesea fără acoperire în realitate clamata - legătură dintre cunoștințele, viziunile și abordările cercetătorilor și teoreticienilor și, respectiv, ale practicienilor. Accentuăm asupra acestui atu al volumului, întrucât, deși majoritatea cărților își propun să se adreseze și să-i intereseze și pe practicieni, puține reușesc să o facă în mod convingător. Iar asta în principal din cauza

faptului că inclusiv sfaturile și recomandările practice sunt, în mod obișnuit, formulate de aceleași persoane care redactează și partea teoretică a capitolelor. Or, în cazul de față doar 3 dintre cele 15 capitole nu conțin rubrica „Colțul antrenorului”, o statistică simplă arătându-ne că 12 dintre cei 36 de contributori ai cărții - 1/3 adică - aparțin breslei antrenorilor.

Cele aproape 300 de pagini sunt distribuite în 5 secțiuni și 15 capitole; primul dintre acestea, introducerea de fapt, aparținând editorilor și fiind intitulat *Dezvoltarea expertizei în sport - întărirea relației/colaborării dintre antrenor și omul de știință*. După care urmează secțiunea de început - *Sistemele expert* - alcătuită din 3 capitole. Titlul primului dintre ele - *Excepționalii (outliers), cifrurile și miturile talentului: jocul (competiția) și pregătirea (antrenamentul) în dezvoltarea sportivului expert* - dă în mod clar seamă de substanța lui, reprezentată de viziunea științifică actuală asupra expertizei în sport, care nu poate fi decât rezultatul interrelației dintre talent - condiție inițială obligatorie - și pregătirea/formarea susținută și adecvată, prin antrenamente și competiții. De altfel, autorii acestui capitol, Joseph Backer și Steve Copley, împreună cu un al treilea, au publicat în 2012 cartea „Identificarea talentului și dezvoltarea în sport. Perspective internaționale”, în care, ca și aici, dar mai pe larg, explorează factorii cheie ai succesului suprem și excelenței în sport, de la zestrea genetică la contextul cultural specific, de la data nașterii la politicile și programele specifice de formare și dezvoltare a sportivilor etc. *Cât de buni suntem în a prognostica viitorul sportivilor* este întrebarea ce dă titlul capitolului care vine în continuare, iar analiza comparativă și critică a diverselor *sisteme funcționale de expertiză în sport* încheie prima secțiune.

Oficialii și antrenorii experți desemnează într-o formulare scurtă aspectele de care se ocupă secțiunea secundă, în cele două capitole din care este formată. Precizăm că prin oficiali se înțelege în genere arbitri și că una dintre ideile importante ale capitolului dedicat acestora, ar fi că „judecățile și deciziile lor ar constitui produse ale procesării informației sociale”; a se vizita, pentru detalii și explicații, site-ul <http://mrfootball.net/refereebias/Sequential%20Effects%20in%20Important%20>

[Referee%20Decisions%20The%20Case%20of%20Penalties%20in%20Soccer.pdf](http://mrfootball.net/refereebias/Sequential%20Effects%20in%20Important%20Referee%20Decisions%20The%20Case%20of%20Penalties%20in%20Soccer.pdf). Pe de altă parte, privitor la *formarea antrenorilor experți*, se reiterează faptul că, la fel ca și în alte domenii de activitate, excelența în antrenorat este asigurată în prea mică măsură de calități înnăscute, cea mai mare parte datorându-se preocupării și informării susținute, precum și obsesiei de a observa, experimenta și crea.

Capitolele 7, 8 și 9 alcătuiesc secțiunea următoare: *Abordări contemporane în antrenorat*. Ea debutează cu un material de peste 15 pagini, alocat *observației ca metodă de instruire* și se încheie cu unul despre *antrenamentul de învățare motorie implicită*. Capitolul central ocupându-se de *organizarea antrenamentului*, cu precizarea că *antrenamentul eficient înseamnă mai mult decât o simplă repetare a unor exerciții*.

Patru capitole de forță formează penultima secțiune: *Procesele sportivului expert*. Sunt teme atât de importante și complexe, încât fiecare, luată separat, ar putea să figureze pe coperta unei cărți. Le amintim, doar, sub formularea titlurilor capitolelor în cauză: ♦ *Cedarea psihică (șocul psihic - choking) în sport: cercetări și implicații*, ♦ *Percepția vizuală la experți: de ce este importantă fixarea privirii (quiet eye) în sport*, ♦ *Rețeta luării unei decizii de expert și ♦ Tactica dezvoltării sportivilor: progrese în tehnologia și psihologia cognitivă*.

Ultima secțiune aparține *experților*. Al unor experți în științele sportului, însă, cele două capitole, alături de introducere, nu sunt prevăzute cu așa-numitul „colț al antrenorului”. Mai întâi, profesorul Bruce Abernethy, un nume „greu” al psihologiei sportive din zilele noastre, ridică problema legăturii strânse ce trebuie să existe între cercetarea și practica sportivă, întrebându-se cât de aproape putem spune că suntem de împlinirea acestui îndreptățit deziderat. Pentru ca încheierea să-i aparțină altei personalități, profesorul Savelsbergh, care-și plasează ideile și concluziile sub un titlu plin de realism: *Drumul spre expertiză nu poate fi unul ușor*.

Gheorghe Dumitru
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EVENTIMENTE EVENTS



Jubileul de diamant al veteranilor atletismului clujean (19) Diamond Jubilee of athletic old-timers from Cluj (19)

În acest an, întâlnirea atleților veterani ai clubului „Universitatea” Cluj a fost una aniversară intitulată „Jubileul de diamant”, deoarece s-au împlinit 60 de ani din anul 1953, înregistrat în anale ca fiind anul cu cea mai bună recoltă de titluri de campioni naționali din istoria clubului. Bilanțul aceluia sezon athletic (1953) a fost următorul: Femei: 100 m - Alexandra Sicoe; 200 m - Alexandra Sicoe; Greutate - Olimpia Câmpeanu; Suliță - Ilona Miklos; Grenadă - Ilona Miklos; Ștafeta 4x100 m - Copândeau, Haffer, Haiduc, Sicoe; Ștafeta 4+3+2+100 m - Pasciuc, Sicoe, Haiduc, Copândeau; Bărbați: 800 m Aurel Palade Ursu; Greutate - Gabriel Georgescu; Ștafeta 4x400 m Moina, Grobei, Ursu, Boitoș.

Evenimentul stabilit cu 19 ani în urmă, cel al întâlnirii anuale al foștilor atleți ai Clubului „Universitatea”, devenit deja tradiție, a reunit și anul acesta un număr important de veterani din generații diferite.

Ca de obicei, la ora 10 a primei zile de sâmbătă din luna septembrie, după formula stabilită cu 19 ani în urmă și care în acest an a fost 7 septembrie, la intrarea pe pista de atletism, lângă obeliscul ridicat în memoria Dr. Ioan Arnăuț, s-au întâlnit o parte a foștilor atleți ai Clubului „U”.

La evenimentul din anul acesta au participat următorii: discobolul Eugen Statnic, vitezistii Virgil Grobei, Mircea Pop și Ilarie Măgdaș, Peter Szekernyes, Dora Copândeau-Dumitrescu, Constanța Taifas-Sicoe, Jutta Haffer, demi-fondista Marilis Cuțui, Traian Sudrigean și Titus Spânu, care este și scriitor, fondistul și alergătorul de 3000 m obstacole Grigore Cojocaru, sulițașii Zörgö Eva-Ráduly, Raduly Károly și Crucița Călugăr, aruncătoarea de greutate Agepsina Rusu și Ilona Szekely, decatlonistul Vasile Bogdan, actualul Decan al Facultății de Educație Fizică a Universității „Babeș-Bolyai”, alergătoarele de garduri Mariana Nedelcu și Anca Hoinărescu, săritorul cu prăjina Traian Bocu.

Deschiderea evenimentului a fost făcută de Prof. Dr. Vasile Bogdan, Decanul FEFS, care, la rândul său, i-a invitat să adreseze mesaje participanților din partea instituțiilor pe care le reprezintă, pe Prorectorul UBB Prof. Dr. Cătălin Rusu, cu un mesaj din partea Conducerii Universității, pe președintele Federației Române de Atletism, Ion Sandu, care a transmis salutul Federației și a înmănat plachete celor mai valoroși dintre veterani, pe președintele executiv al CS „Universitatea” Ovidiu Vasu, care a adresat participanților un mesaj din partea Clubului.



De la stânga la dreapta: Ing. Dr. Ovidiu Vasu - Președintele Clubului „U”, Prof. Dr. Vasile Bogdan - Decanul FEFS, Prof. Ion Sandu - Președintele FRA, Prof. Dr. Cătălin Rusu - Prorector UBB, Prof. Dr. Traian Bocu - Redactor șef Palestrica Mileniului III, Virgil Grobei, Ilarie Măgdaș (fotograf), Grigore Cojocaru.



De la stânga la dreapta: Agepsina Rusu, Anca Hoinărescu, Jutta Haffer, Zörgö Eva -Ráduly, Titus Spânu, Traian Sudrigean, Eugen Statnic.



Momentul deschiderii evenimentului jubiliar: Prof. Dr. Vasile Bogdan, Decanul Facultății de Educație Fizică și Sport din cadrul UBB Cluj, alături, Aurel Palade Ursu. În stânga pe bancă: Titus Spânu, Traian Sudrigan, Eugen Statnic. Pe banca din față - plan îndepărtat: d-na Cojocaru, Marilis Cuțui, Dora Copândeian-Dumitrescu, Constanța Taifas-Sicoe, d-na Grobei. Pe banca lateral dreapta: Virgil Grobei, Ilarie Măgdaș, Grigore Cojocaru. În plan îndepărtat: Prof. Ion Sandu - Președintele Federației Române de Atletism (FRA), Prof. Dr. Cătălin Rusu - Prorector Universitatea „Babeș-Bolyai” (UBB). Pe bancă cu spatele: Jutta Haffer, Anca Hoinărescu, Agepsina Rusu.



Înmânare de distincții: Prof. Ion Sandu - Președinte FRA, Prof. Dr. Cătălin Rusu - Prorector UBB, Ovidiu Vasu - Președinte Club „U”, Prof. Dr. Traian Bocu - Redactor șef PM III.



Președintele FRA Ion Sandu, stânga, pregătindu-se pentru înmânarea distincțiilor: Prof. Dr. Vasile Bogdan, Prof. Dr. Cătălin Rusu, Președintele „U” Ovidiu Vasu, Virgil Grobei, Prof. Dr. Traian Bocu, Grigore Cojocaru, Szekely Ilona, Ráduly Károly.



Unul din momentele înmânării distincțiilor. Premiata: Zörgő Eva-Ráduly, care primește placheta Jubileului de diamant din partea lui Vasile Bogdan și Aurel Palade Ursu. Pe banca din față, Mircea Pop și Szekely Ilona.



Doi dintre veteranii de bază: Eugen Statnic (85), fost aruncător de disc și Aurel Palade Ursu (80), fost demifondist 400, 800 m.



Placheta înmănată veteranilor participanți la reuniune, din partea organizatorilor.

FOR THE ATTENTION OF CONTRIBUTORS

The subject of the Journal

The journal has a multidisciplinary nature oriented toward biomedical, health, exercise, social sciences fields, applicable in activities of physical training and sport, so that the dealt subjects and the authors belong to several disciplines in these fields. The main rubrics are: “Original studies” and “Reviews”.

Regarding “Reviews” the main subjects that are presented are: oxidative stress in physical effort; mental training; psycho-neuroendocrinology of sport effort; physical culture in the practice of the family doctor; extreme sports and risks; emotional determinatives of performance; the recovery of patients with spinal column disorders; stress syndromes and psychosomatics; olympic education, legal aspects of sport; physical effort in the elderly; psychomotricity disorders; high altitude sportive training; fitness; biomechanics of movements; EUROFIT tests and other evaluation methods of physical effort; adverse reactions of physical effort; sport endocrinology; depression in sportsmen/women; classical and genetic drug usage; Olympic Games etc.

Among articles devoted to original studies and researches we are particularly interested in the following: the methodology in physical education and sport; influence of some ions on effort capacity; psychological profiles of students regarding physical education; methodology in sport gymnastics; the selection of performance sportsmen.

Other articles approach particular subjects regarding different sports: swimming, rhythmic and artistic gymnastics, handball, volleyball, basketball, athletics, ski, football, field and table tennis, wrestling, sumo.

The authors of the two rubrics are doctors, professors and educators, from universities and preuniversity education, trainers, scientific researchers etc.

Other rubrics of the journal are: the editorial, editorial news, reviews of the latest books in the field and others that are presented rarely (inventions and innovations, universitaria, preuniversitaria, forum, memories, competition calendar, portraits, scientific events).

We highlight the rubric “The memory of the photographic eye”, where photos, some very rare, of sportsmen in the past and present are presented.

Articles signed by authors from the Republic of Moldova regarding the organization of sport education, variability of the cardiac rhythm, the stages of effort adaptability and articles by some authors from France, Portugal, Canada must also be mentioned.

The main objective of the journal is highlighting the results of research activities as well as the permanent and actual dissemination of information for specialists in the field. The journal assumes an important role regarding the achievement of necessary scores of the teaching staff in the university and preuniversity education as well as of doctors in the medical network (by recognizing the journal by the Romanian College of Physicians), regarding didactic and professional promotion.

Another merit of the journal is the obligatory publication of the table of contents and an English summary for all articles. Frequently articles are published in extenso in a language with international circulation (English, French).

The journal is published quarterly and the works are accepted for publication in the Romanian and English language. The journal is sent by e-mail or on a floppy disk (or CD-ROM) and printed, by mail at the address of the editorial staff. The works of contributors that are resident abroad and of Romanian authors must be mailed to the Editorial staff at the following address:

„Palestrica of the third millennium – Civilization and sport”

Chief Editor: Prof. dr. Traian Bocu

Contact address: palestrica@gmail.com or traian_bocu@yahoo.com

Mail address: Clinicilor street no. 1 postal code 400006, Cluj-Napoca, România

Telephone: 0264-598575

Website: www.pm3.ro

Objectives

Our intention is that the journal continues to be a route to highlight the research results of its contributors, especially by stimulating their participation in project competitions. Articles that are published in this journal are considered as part of the process of promotion in one’s university career (accreditation that is obtained after consultation with the National Council for Attestation of University Titles and Diplomas).

We also intend to encourage the publication of studies and research, that include original relevant elements especially from young people. All articles must bring a minimum of personal contribution (theoretical or practical), that will be highlighted in the article.

In the future we propose to accomplish criteria that would allow the promotion of the journal to superior levels according international recognition.

THE STRUCTURE AND SUBMISSION OF ARTICLES

The manuscript must be prepared according to the stipulations of the International Committee of Medical Journal Editors (<http://www.icmjee.org>).

The number of words for the electronic format:

– 4000 words for original articles;

- 2000 words for case studies;
- 5000-6000 words for review articles.

Format of the page: edited in WORD format, A4. Printed pages of the article will be numbered successively from 1 to the final page.

Font: Times New Roman, size 11 pt.; it should be edited on a full page, with diacritical marks, double spaced, respecting equal margins of 2 cm.

Illustrations:

The images (graphics, photos etc.) should be numbered consecutively in the text, with arabic numbers. They should be edited with EXCEL or SPSS programs, and sent as distinct files: „figure 1.tif”, „figure 2. jpg”, and at the editors demanding in original also. Every graphic should have a legend, written **under** the image.

The tables should be numbered consecutively in the text, with roman numbers, and sent as distinct files, accompanied by a legend that will be put **above** the table.

PREPARATION OF THE ARTICLES

1. Title page: – includes the title of article (maximum 45 characters), the name of authors followed by surname, work place, mail address of the institute and mail address and e-mail address of the first author. It will follow the name of article in the English language.

2. Summary: For original articles a summary structured like this is necessary: (Premize-Background, Obiective-Aims, Metode-Methods, Resultate-Results, Concluzii-Conclusions), in the Romanian language, of maximum 250 words, followed by 3-8 key words (if its possible from the list of established terms). All articles will have a summary in the English language. Within the summary (abstract) abbreviations, footnotes or bibliographic references should not be used.

Premises and objectives. Description of the importance of the study and explanation of premises and research objectives.

Methods. Include the following aspects of the study:

Description of the basic category of the study: of orientation and applicative.

Localization and the period of study. Description and size of groups, sex (gender), age and other socio-demographic variables should be given.

Methods and instruments of investigation that are used.

Results. The descriptive and inferential statistical data (with specification of the used statistical tests): the differences between the initial and the final measurement, for the investigated parameters, the significance of correlation coefficients are necessary. The specification of the level of significance (the value *p* or the dimension of effect *d*) and the type of the used statistical test etc are obligatory.

Conclusions. Conclusions that have a direct link with the presented study should be given.

Orientation articles and case studies should have an unstructured summary (without respecting the structure of experimental articles) to a limit of 150 words.

3. Text

Original articles should include the following chapters which will not be identical with the summary titles: Introduction (General considerations), Hypothesis, Materials and methods (including ethical and statistical informations), Results, Discussing results, Conclusions and suggestions. Other type of articles, as orientation articles, case studies, Editorials, do not have an obligatory format. Excessive abbreviations are not recommended. The first abbreviation in the text is represented first *in extenso*, having its abbreviation in parenthesis, and thereafter the short form should be used.

Authors must undertake the responsibility for the correctness of published materials.

4. Bibliography

The bibliography should include the following data:

For articles from journals or other periodical publications the international Vancouver Reference Style should be used: the name of all authors as initials and the surname, the year of publication, the title of the article in its original language, the title of the journal in its international abbreviation (italic characters), number of volume, pages.

Articles: Pop M, Albu VR, Vişan D et al. Probleme de pedagogie în sport. *Educație Fizică și Sport* 2000; 25(4):2-8.

Books: Drăgan I (coord.). *Medicina sportivă*, Editura Medicală, 2002, Bucureşti, 2002, 272-275.

Chapters from books: Hăulică I, Bălţatu O. Fiziologia senescenţei. In: Hăulică I. (sub red.) *Fiziologia umană*, Ed. Medicală, Bucureşti, 1996, 931-947.

Starting with issue 4/2010, every article should include a minimum of 15 bibliographic references and a maximum of 100, mostly journals articles published in the last 10 years. Only a limited number of references (1-3) older than 10 years will be allowed. At least 20% of the cited resources should be from recent international literature (not older than 10 years).

Peer-review process

In the final stage all materials will be closely reviewed by at least two competent referees in the field (Professors, and Docent doctors) so as to correspond in content and form with the requirements of an international journal. After this stage, the materials will be sent to the journal's referees, according to their profiles. After receiving the observations from the referees, the editorial staff shall inform the authors of necessary corrections and the publishing requirements of the journal. This process (from receiving the article to transmitting the observations) should last about 4 weeks. The author will be informed if the article was accepted for publication or not. If it is accepted, the period of correction by the author will follow in order to correspond to the publishing requirements.

Conflict of interest

The authors must mention all possible conflicts of interest including financial and other types. If you are sure that there is no conflict of interest we ask you to mention this. The financing sources should be mentioned in your work too.

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The specifications must be made only linked to the people outside the study but which have had a substantial contribution, such as some statistical processing or review of the text in the English language. The authors have the responsibility to obtain the written permission from the mentioned persons with the name written within the respective chapter, in case the readers refer to the interpretation of results and conclusions of these persons. Also it should be specified if the article uses some partial results from certain projects or if these are based on master or doctoral theses sustained by the author.

Ethical criteria

The Editors will notify authors in due time, whether their article is accepted or not or whether there is a need to modify texts. Also the Editors reserve the right to edit articles accordingly. Papers that have been printed or sent for publication to other journals will not be accepted. All authors should send a separate letter containing a written statement proposing the article for submission, pledging to observe the ethics of citation of sources used (bibliographic references, figures, tables, questionnaires).

For original papers, according to the requirements of the Helsinki Declaration, the Amsterdam Protocol, Directive 86/609/EEC, and the regulations of the Bioethical Committees from the locations where the studies were performed, the authors must provide the following:

- the informed consent of the family, for studies in children and juniors;
- the informed consent of adult subjects, patients and athletes, for their participation;
- malpractice insurance certificate for doctors, for studies in human subjects;
- certificate from the Bioethical Committees, for human study protocols;
- certificate from the Bioethical Committees, for animal study protocols.

The data will be mentioned in the paper, in the section Materials and Methods. The documents will be obtained before the beginning of the study. Will be mentioned also the registration number of the certificate from the Bioethical Committees.

Editorial submissions will be not returned to authors, whether published or not.

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Requests for advertising space should be sent to the Editors of the "Palestrica of the Third Millennium" journal, 1, Clinicilor St., 400006, Cluj-Napoca, Romania. The price of an A4 full colour page of advertising for 2012 will be EUR 250 and EUR 800 for an advert in all 4 issues. The costs of publication of a logo on the cover will be determined according to its size. Payment should be made to the Romanian Medical Society of Physical Education and Sports, CIF 26198743. Banca Transilvania, Cluj branch, IBAN: RO32 BTRL 0130 1205 S623 12XX (RON).

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Please note that in 2010 a tax for each article submitted was introduced. Consequently, all authors of articles will pay the sum of 150 RON to the Romanian Medical Society of Physical Education and Sport published above. Authors who have paid the subscription fee will be exempt from this tax. Other information can be obtained online at www.pm3.ro "Instructions for Authors", at our e-mail address palestrica@gmail.com or at the postal address: 1, Clinicilor St., 400006, Cluj-Napoca, Romania, phone: +40264-598575.

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ÎN ATENȚIA COLABORATORILOR

Tematica revistei

Ca tematică, revista are un caracter multidisciplinar orientat pe domeniile biomedical, sănătate, efort fizic, științe sociale, aplicate la activitățile de educație fizică și sport, astfel încât subiectele tratate și autorii aparțin mai multor specialități din aceste domenii. Principalele rubrici sunt: „Articole originale” și „Articole de sinteză”.

Exemplificăm rubrica „Articole de sinteză” prin temele importante expuse: stresul oxidativ în efortul fizic; antrenamentul mintal; psihoneuroendocrinologia efortului sportiv; cultura fizică în practica medicului de familie; sporturi extreme și riscuri; determinanți emoționali ai performanței; recuperarea pacienților cu suferințe ale coloanei vertebrale; sindroame de stres și psihosomatică; educația olimpică, aspecte juridice ale sportului; efortul fizic la vârstnici; tulburări ale psihomotricității; pregătirea sportivă la altitudine; fitness; biomecanica mișcărilor; testele EUROFIT și alte metode de evaluare a efortului fizic; reacții adverse ale eforturilor; endocrinologie sportivă; depresia la sportivi; dopajul clasic și genetic; Jocurile Olimpice etc.

Dintre articolele consacrate studiilor și cercetărilor experimentale notăm pe cele care vizează: metodică educației fizice și sportului; influența unor ioni asupra capacității de efort; profilul psihologic al studentului la educație fizică; metodică în gimnastica sportivă; selecția sportivilor de performanță.

Alte articole tratează teme particulare vizând diferite sporturi: înotul, gimnastica ritmică și artistică, handbalul, voleiul, baschetul, atletismul, schiul, fotbalul, tenisul de masă și câmp, luptele libere, sumo.

Autorii celor două rubrici de mai sus sunt medici, profesori și educatori din învățământul universitar și preuniversitar, antrenori, cercetători științifici etc.

Alte rubrici ale revistei sunt: editorialul, actualitățile editoriale, recenziile unor cărți - ultimele publicate în domeniu, la care se adaugă și altele prezentate mai rar (invenții și inovații, universitaria, preuniversitaria, forum, remember, calendar competițional, portrete, evenimente științifice).

Subliniem rubrica “Memoria ochiului fotografic”, unde se prezintă fotografii, unele foarte rare, ale sportivilor din trecut și prezent.

De menționat articolele semnate de autori din Republica Moldova privind organizarea învățământului sportiv, variabilitatea ritmului cardiac, etapele adaptării la efort, articole ale unor autori din Franța, Portugalia, Canada.

Scopul principal al revistei îl constituie valorificarea rezultatelor activităților de cercetare precum și informarea permanentă și actuală a specialiștilor din domeniile amintite. Revista își asumă și un rol important în îndeplinirea punctajelor necesare cadrelor didactice din învățământul universitar și preuniversitar precum și medicilor din rețeaua medicală (prin recunoașterea revistei de către Colegiul Medicilor din România), în avansarea didactică și profesională.

Un alt merit al revistei este publicarea obligatorie a cuprinsului și a câte unui rezumat în limba engleză, pentru toate articolele. Frecvent sunt publicate articole în extenso într-o limbă de circulație internațională (engleză, franceză).

Revista este publicată trimestrial iar lucrările sunt acceptate pentru publicare în limba română și engleză. Articolele vor fi redactate în format WORD (nu se acceptă articole în format PDF). Expedierea se face prin e-mail sau pe dischetă (sau CD-ROM) și listate, prin poștă pe adresa redacției. Lucrările colaboratorilor rezidenți în străinătate și ale autorilor români trebuie expediate pe adresa redacției:

Revista «Palestrica Mileniului III»

Redactor șef: Prof. dr. Traian Bocu

Adresa de contact: palestrica@gmail.com sau traian_bocu@yahoo.com

Adresa poștală: Str. Clinicilor nr.1 cod 400006, Cluj-Napoca, România

Telefon:0264-598575

Website: www.pm3.ro

Obiective

Ne propunem ca revista să continue a fi o formă de valorificare a rezultatelor activității de cercetare a colaboratorilor săi, în special prin stimularea participării acestora la competiții de proiecte. Menționăm că articolele publicate în cadrul revistei sunt luate în considerare în procesul de promovare în cariera universitară (acreditare obținută în urma consultării Consiliului Național de Atestare a Titlurilor și Diplomelor Universitare).

Ne propunem de asemenea să încurajăm publicarea de studii și cercetări, care să cuprindă elemente originale relevante mai ales de către tineri. Toate articolele vor trebui să aducă un minimum de contribuție personală (teoretică sau practică), care să fie evidențiată în cadrul articolului.

În perspectivă ne propunem îndeplinirea criteriilor care să permită promovarea revistei la niveluri superioare cu recunoaștere internațională.

STRUCTURA ȘI TRIMITEREA ARTICOLELOR

Manuscrisul trebuie pregătit în acord cu prevederile Comitetului Internațional al Editurilor Revistelor Medicale (<http://www.icmjee.org>).

Numărul cuvintelor pentru formatul electronic:

- 4000 cuvinte pentru articolele originale,
- 2000 de cuvinte pentru studiile de caz,
- 5000–6000 cuvinte pentru articolele de sinteză.

Format pagină: redactarea va fi realizată în format A4. Paginile listate ale articolului vor fi numerotate succesiv de la 1 până la pagina finală.

Font: Times New Roman, mărime 11 pt.; redactarea se va face pe pagina întreagă, cu diacritice, la două rânduri, respectând margini egale de 2 cm pe toate laturile.

Ilustrațiile:

Figurile (grafice, fotografii etc.) vor fi numerotate consecutiv în text, cu cifre arabe. Vor fi editate cu programul EXCEL sau SPSS, și vor fi trimise ca fișiere separate: „figura 1.tif”, „figura 2. jpg”, iar la solicitarea redacției și în original. Fiecare grafic va avea o legendă care se trece **sub** figura respectivă.

Tabelele vor fi numerotate consecutiv în text, cu cifre romane, și vor fi trimise ca fișiere separate, însoțite de o legendă ce se plasează **deasupra** tabelului.

PREGĂTIREA ARTICOLELOR

1. Pagina de titlu: – cuprinde titlul articolului (maxim 45 caractere), numele autorilor urmat de prenume, locul de muncă, adresa postală a instituției, adresa poștală și adresa e-mail a primului autor. Va fi urmat de titlul articolului în limba engleză.

2. Rezumatul: Pentru articolele experimentale este necesar un rezumat structurat (Premize-Background, Obiective-Aims, Metode-Methods, Rezultate-Results, Concluzii-Conclusions), în limba română, de maxim 250 cuvinte (20 de rânduri, font Times New Roman, font size 11), urmat de 3–5 cuvinte cheie (dacă este posibil din lista de termeni consacrați). Toate articolele vor avea un rezumat în limba engleză. Nu se vor folosi prescurtări, note de subsol sau referințe.

Premize și obiective: descrierea importanței studiului și precizarea premizelor și obiectivelor cercetării.

Metodele: includ următoarele aspecte ale studiului:

Descrierea categoriei de bază a studiului: de orientare sau aplicativ.

Localizarea și perioada de desfășurare a studiului. Colaboratorii vor prezenta descrierea și mărimea loturilor, sexul (genul), vârsta și alte variabile socio-demografice.

Metodele și instrumentele de investigație folosite.

Rezultatele vor prezenta datele statistice descriptive și inferențiale obținute (cu precizarea testelor statistice folosite): diferențele dintre măsurătoarea inițială și cea finală, pentru parametri investigați, semnificația coeficienților de corelație. Este obligatorie precizarea nivelului de semnificație (valoarea *p* sau mărimea efectului *d*) și a testului statistic folosit etc.

Concluziile care au directă legătură cu studiul prezentat.

Articolele de orientare și studiile de caz vor avea un rezumat nestructurat (fără a respecta structura articolelor experimentale) în limita a 150 cuvinte (maxim 12 rânduri, font Times New Roman, font size 11).

3. Textul

Articolele experimentale vor cuprinde următoarele capitole: Introducere, Ipoteză, Materiale și Metode (inclusiv informațiile etice și statistice), Rezultate, Discutarea rezultatelor, Concluzii (și propuneri). Celelalte tipuri de articole, cum ar fi articolele de orientare, studiile de caz, editorialele, nu au un format impus.

Răspunderea pentru corectitudinea materialelor publicate revine în întregime autorilor.

4. Bibliografia

Bibliografia va cuprinde:

Pentru articole din reviste sau alte periodice se va menționa: numele tuturor autorilor și inițialele prenumelui, anul apariției, titlul articolului în limba originală, titlul revistei în prescurtare internațională (caractere italice), numărul volumului, paginile

Articole: Pop M, Albu VR, Vișan D et al. Probleme de pedagogie în sport. Educația Fizică și Sportul 2000; 25(4):2-8.

Cărți: Drăgan I (coord.). Medicina sportivă aplicată. Ed. Editis, București 1994, 372-375.

Capitole din cărți: Hăulică I, Bălțatu O. Fiziologia senescentei. În: Hăulică I. (sub red.) Fiziologia umană. Ed. Medicală, București 1996, 931-947.

Începând cu revista 4/2010, fiecare articol va trebui să se bazeze pe un minimum de 15 și un maximum de 100 referințe bibliografice, în majoritate articole nu mai vechi de 10 ani. Sunt admise un număr limitat de cărți și articole de referință (1-3), cu o vechime mai mare de 10 ani. Un procent de 20% din referințele bibliografice citate trebuie să menționeze literatură străină studiată, cu respectarea criteriului actualității acesteia (nu mai vechi de 10 ani).

Procesul de recenzare (peer-review)

Într-o primă etapă toate materialele sunt revizuite riguros de cel puțin doi referenți competenți în domeniu respectiv (profesori universitari doctori și doctori docenți) pentru ca textele să corespundă ca fond și formă de prezentare cerințelor unei reviste serioase. După această etapă materialele sunt expediate referenților revistei, în funcție de profilul materialelor. În urma observațiilor primite din partea referenților, redacția comunică observațiile autorilor în vederea corectării acestora și încadrării în cerințele de publicare impuse de revistă. Acest proces (de la primirea articolului până la transmiterea observațiilor) durează aproximativ 4 săptămâni. Cu această ocazie se comunică autorului dacă articolul a fost acceptat spre publicare sau nu. În situația acceptării, urmează perioada de corectare a articolului de către autor în vederea încadrării în criteriile de publicare.

Conflicte de interese

Se cere autorilor să menționeze toate posibilele conflicte de interese incluzând relațiile financiare și de alte tipuri. Dacă sunteți siguri că nu există nici un conflict de interese vă rugăm să menționați acest lucru. Sursele de finanțare ar trebui să

fie menționate în lucrarea dumneavoastră.

Precizări

Precizările trebuie făcute doar în legătură cu persoanele din afara studiului, care au avut o contribuție substanțială la studiul respectiv, cum ar fi anumite prelucrări statistice sau revizuirea textului în limba engleză. Autorii au responsabilitatea de a obține permisiunea scrisă din partea persoanelor menționate cu numele în cadrul acestui capitol, în caz că cititorii se referă la interpretarea rezultatelor și concluziilor acestor persoane. De asemenea, la acest capitol se vor face precizări în cazul în care articolul valorifică rezultate parțiale din anumite proiecte sau dacă acesta se bazează pe teze de masterat sau doctorat susținute de autor, alte precizări.

Criterii deontologice

Redacția va răspunde în timp util autorilor privind acceptarea, neacceptarea sau necesitatea modificării textului și își rezervă dreptul de a opera modificări care vizează forma lucrărilor.

Nu se acceptă lucrări care au mai fost tipărite sau trimise spre publicare la alte reviste. Autorii vor trimite redacției odată cu articolul propus spre publicare, într-un fișier word separat, o declarație scrisă în acest sens, cu angajamentul respectării normelor deontologice referitoare la citarea surselor pentru materialele folosite (referințe bibliografice, figuri, tabele, chestionare).

Pentru articolele originale, în conformitate cu îndeplinirea condițiilor Declarației de la Helsinki, a Protocolului de la Amsterdam, a Directivei 86/609/EEC și a reglementărilor Comisiilor de Bioetică din locațiile unde s-au efectuat studiile, autorii trebuie să prezinte:

- acordul informat din partea familiei, pentru studiile pe copii și juniori;
- acordul informat din partea subiecților adulți, pacienți și sportivi, pentru participare;
- adeverință de Malpraxis pentru medici, pentru cercetările/studiile pe subiecți umani;
- adeverință din partea Comisiilor de Etică, pentru protocolul de studiu pe subiecți umani;
- adeverință din partea Comisiilor de Bioetică, pentru protocolul de studiu pe animale.

Datele vor fi menționate în articol la secțiunea Material și metodă. Documentele vor fi obținute înainte de începerea studiului. Se va menționa și numărul de înregistrare al adeverinței din partea Comisiilor de Etică.

Materialele trimise la redacție nu se restituie autorilor, indiferent dacă sunt publicate sau nu.

ÎN ATENȚIA SPONSORILOR

Solicitările pentru spațiile de reclamă, vor fi adresate redacției revistei "Palestrica Mileniului III", Str. Clinicilor nr. 1, cod 400006 Cluj-Napoca, România. Prețul unei pagini de reclamă full color A4 pentru anul 2012 va fi de 250 EURO pentru o apariție și 800 EURO pentru 4 apariții. Costurile publicării unui Logo pe copertile revistei, vor fi stabilite în funcție de spațiul ocupat. Plata se va face în contul Societății Medicale Române de Educație Fizică și Sport, CIF 26198743. Banca Transilvania, sucursala Cluj Cod IBAN: RO32 BTRL 0130 1205 S623 12XX (LEI).

ÎN ATENȚIA ABONAȚILOR

Revista "Palestrica Mileniului III" este tipărită trimestrial, prețul unui abonament fiind pentru străinătate de 100 Euro pentru instituții, și 50 Euro individual. Pentru intern, prețul unui abonament instituțional este de 120 lei, al unui abonament individual de 100 lei. Menționăm că taxele de difuzare poștală sunt incluse în costuri.

Plata abonamentelor se va face prin mandat poștal în contul Societății Medicale Române de Educație Fizică și Sport, CIF 26198743. Banca Transilvania, sucursala Cluj Cod IBAN: RO32 BTRL 0130 1205 S623 12XX (LEI); RO07 BTRL 01304205 S623 12XX (EURO); RO56 BTRL 01302205 S623 12XX (USD). SWIFT: BTRLRO 22

Precizăm că începând cu anul 2010 a fost introdusă taxa de articol. Ca urmare, toți autorii semnatari ai unui articol vor achita împreună suma de 150 Lei, în contul Societății Medicale Române de Educație Fizică și Sport publicat mai sus.

Autorii care au abonament vor fi scutiți de această taxă de articol.

Alte informații se pot obține online de pe www.pm3.ro „Pentru autori” sau pe adresa de mail a redacției palestrica@gmail.com sau pe adresa poștală: Str. Clinicilor nr.1 cod 400006, Cluj-Napoca, România, Telefon:0264-598575.

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