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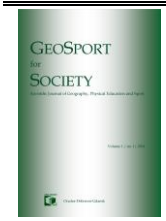

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Issues concerning the use of strength and power practice, during the preparatory period, for U19 youth football players

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Abstract. The aim of this study is to see if the strength and power type exercise, applied to young professional football players to increase active muscle to optimal values, may be used during the preparatory period without adverse affect on physical fitness (agility, speed, explosive power, anaerobic capacity, aerobic endurance)

Keywords: football, physical training, young football players, strength and power practice

Introduction

Modern football requires balanced muscle development to withstand all the stresses to which a football player is subjected, mainly due to the repetition of specific actions and exercises of this sport and various "shocks" such as: violent contact with the ball (huge amount of shots taken), contact with the pitch (falls, tumbles, fouls received, jumps to the ground) and tackles (collision with the opponents feet, body).

Strength and power practice trainings are addressed to junior football players by respecting mandatory fundamental principles: general musculation must precede specific musculation, unloaded musculation must precede loaded musculation, prior introduction to specific technique, individualization programme and gradual increase of loading used (Aubert, 2002).

In the specialty literature we find numerous references related to the age at which musculation training with load for young players can be started. Most specialists opinions (Weinek, 1996; Thiebault, 1998; Commeti, 2002; Turpin, 2002)

converge towards 15-16 years old as it is thought that until then the secretion of testosterone does not increase significantly (after puberty), possible mass gains are insignificant compared to the risks the subjects are exposed to.

As a result of specific measurements (waist, weight, percentage of body fat), performed by the team physician to players of a 2nd division football team in Romania, there was a deficit of muscle mass in all subjects. This can be explained to some extent by the fact that they are very young (19.8 ± 1.73 years), many of them are still in junior age. In order to eliminate such shortcomings and the idea to prevent muscular and joint accidents or injuries, it was agreed at the preparatory period, to implement a programme oriented to increase muscle mass to the subjects in this matter.

During adolescence, soccer players presented significant differences in terms of body composition and physique. Thus, these findings could be employed by coaches and fitness trainers engaged in soccer training in the context of physical fitness assessment and talent identification (Dumitrescu, 2010; Pantelis & Nikos, 2011).

It is widely diffused in literature that the resistance training allows strength and hypertrophy gains (Goto et al. 2004; Harris et al. 2004; Ganea et al. 2005; Sooneste et al. 2013). To allow optimal gains, the training should be performed with loads between 65-80% 1RM (one repetition maximum) and frequency of training between two and three times per week, at least (American College of Sports Medicine.; 2009). Moreover, larger volumes of training appear enable better muscle adaptations in comparison with low volumes (Sooneste et al. 2013). Opinions on the time requires to obtain a significant muscular hypertrophy in young football players is between 3 weeks (American College of Sports Medicine, 2009) and 7 weeks (Ozmun et al., 1994; Faigenbaum et al., 2000; Garcia et al., 2005). We decided for a classic version (Weineck, 1997; Wilmore & Costill, 2002; Bompa, 2003), about 4-6 weeks working to achieve a significant improvement in active muscle mass.

As such, we proposed a decrease in the percentage of fat for our subjects, with decreased body weight by achieving an increase in muscle mass. The concentration of fat in professional footballers' body is usually comprised between 9 and 19% (Reilly & Williams, 2003; Bandyopadhyay, 2007; McArdle et al., 2007) as per population age comparable with the subjects of this work meet values: 11.3 (Hazir T. (2010, young Turkish players in the 1st division), 12.6 (Dunbar, 1997, football players in the Portuguese 1st division) or 12.3 (Brewer, 1990, the first and second English football league).

We consider useful the implementation of practices with this kind of objectives during the preparatory period and from the point of view of body composition regulation, because in the off-season, regardless of the level in which they perform, they tend to gain fat (White et al., 1988). Ostojic and Zivanic (2001) found that body fat percent of Serbian professional football players decreased significantly during the race season and increased out of season. Burke et al., (1986) and Reilly (2003) pointed out that fat in the body of football players may accumulate out of season and players may lose more weight during pre-season training than other periods.

Hypothesis

Strength and power training type, aimed to increase active muscle mass for young professional football players to optimal values, can be successfully addressed during the preparatory period, without adverse affect on physical fitness level (agility, speed, explosive power, anaerobic capacity, aerobic endurance) during that period.

Material and methods

Subjects and groups

The experimental group: 15 players from 2nd division club FC Bihor Oradea, age 18.4 ± 1.15, 178.5 ± 5.44 cm. size, weight: 69.3 ± 5.63 kg., conducted training for 8 weeks before the start of the 2011/12 season, under the lead of a football coach and a strength & conditioning coach.

Control group: 15 players (FC Liberty Salonta U19), age 18.2 ± 1.04, height: 176.4 ± 4.78 cm., weight: 70.1 ± 4.25 kg., have conducted training during the same period of time, under a specialised football coach, as it was intended. The number of training sessions conducted weekly was comparable to that of subjects in the experimental group, the only change regarding the strength practices used predominantly in circuit training.

The administration of nutritional supplements (protein, vitamins, minerals) was made by the medical team, in the same way to both groups.

The number of subjects in both groups is lower than the number of the entire roster for good reason, as not all of them could support the two tests.

Method

Targeted training sessions to develop muscle mass (musculation) were planned during the 8 weeks of the experiment under the form of 2 modules of 4 weeks each, being performed 4 training sessions in the power gym each week.

Thus, training in the power gym has been applied during the 8 weeks in a total of 32 times, the dosing means used having been illustrated in the following table (table 1). Each training session (total duration of 60 minute per session) was preceded by a general warm up of 12-15 minutes and ended with a round of 8-10 minutes of muscle stretching, oriented mainly towards the targeted muscle groups in that training. The drills used were the kind with a concentric contraction, with submaximal exercise intensity (between 60% and 75% of 1RM) with a number of 8-12 repetitions/series.

Based on the initial testing results achieved, the players were divided into four value groups, so as the dosing for training loads to be accurate.

Test applied

The measurements conducted by us on the subjects can be grouped in two main categories: measurements in the doctor's office: size, weight and body composition (skinfold measurements, body fat percentage). Percent of body fat (BF) was calculated from the sum of 10 skinfolds (cheek, wattle, chest I, triceps, subscapular, abdominal, chest II, suprailiac, thigh and calf) using a skinfold calliper (Harpenden, West Sussex, UK), based on the formula proposed by Parizkova,1978.

(table 2) and measurements taken on the field in the following tests: 30 meter standing start, the shuttle 10-20-40-50 meters, long jump without momentum, estimating maximal aerobic speed (MAS) by means of the field Brikci-Dekkar test and the press oblique 45° test (table 3).

Table 1. Dosing used during the eight weeks of the experiment

	MODULE 1			MODULE 2		
Time	4 weeks			4 weeks		
Frequency	4 practices/ week			4 practices/ week		
Targeted muscular groups/practice	Legs	Trunk	Upper limbs	Legs	Trunk	Upper limbs
No. of exercises	3	3	3	3	4	4
No. de sets/ex.	4-6	4	4	6	5	5
No. repetitions/sets	10	12	12	8	10	10
Intensity	65% 1RM	60% 1RM	65% 1RM	75% 1RM	70% 1RM	75% 1RM
Break between sets	~1'	~1'	~1'	~1'30"	~1'30"	~1'30"
Break between exercises	2-3'	2-3'	2-3'	2-3'	2-3'	2-3'

Table 2. The arithmetic averages and the differences between them in terms of measurements taken in the doctor's office for the two groups (experimental and control) at each of the two tests (initial and final)

Group	Initial Testing (T.I.)			Final Testing (T.F.)			T.F.-T.I.	
	Weight	Fat percentage	Body mass index	Weight	Fat percentage	Body mass index	Mass muscle gain	Decrease of fat percentage
	(kg.)	(%)	(BMI)	(kg.)	(%)	(BMI)		
Experimental	69.3	14.6	21,9	69.8	12.1	22,2	+2,6 kg.	-2.5 %
Control	70.1	15.3	22,2	70.3	14.5	22,3	+0,7 kg.	-0.8 %

Table 3. The arithmetic mean of the results achieved in the control samples used by the subjects in the two groups at each of the two tests and progress registered between them (in percentage - % and through the effect size - ES)

Test	Experimental group				Control group			
	T.I.	T.F.	Progress		T.I.	T.F.	Progress	
			(%)	ES			(%)	ES
30 meters standing start (s.)	4,15	3,96	4,7	0,87	4,19	4,07	2,8	0,35
The shuttle 10-20-40-50 meters (s.)	43,11	41,21	4,4	0,95	43,82	42,55	2,9	0,48
Standing long jump (m.)	2,27	2,39	5,5	1,15	2,23	2,30	3,1	0,37

Maximal aerobic speed (MAS) km./h.)	17,14	18,19	6,1	1,08	16,61	17,16	3,3	0,58
Press oblique 45 ° (kg.)	123,55	137,76	11,5	1,24	121,24	126,94	5,4	0,62

Results and discussion

The experimental group's work resulted in an average gain of 2.6 kg of mass muscle together with a decrease of 2.5% in fat concentration. By comparison, the control group gained 0.7 kg of active mass muscle together with a decrease of 0.8% in fat concentration. The field tests used to evaluate efficiency of work during the preparatory period to improve the physical condition of the players of the two groups, conclude in all control tests a superior progress to those in the experimental group compared to those in the control group, so as shown in table no. 3. We chose to highlight the progress made between the two tests in each group involved in our research through two indicators:

- the difference between arithmetic averages of registered performances in the control samples used by the subjects in the two groups (experimental and control) in each of the two tests (initial and final), as a percentage (%) and
- through the effect size (ES) that (Thomas et al., 2010), represents the difference between the arithmetic averages of standardized performance over the control samples used by the subjects in the two groups in each of the two tests.

Conclusions

The results confirm the research hypothesis.

The results registered for the 5 tests performed during our experimental research underline the fact that the efficiency of the activity developed on the level of the experimental group was superior to that from the control group. The progress registered (expressed in percentages and by the size of the effect) in each of the 5 control tests used, was superior in favour of the subjects from the experimental group, which confirms the accuracy of the means and methods used.

Well integrated into the overall preparation of a football team during its preparatory period, strength and conditioning practice training can bring an increase in active muscle mass while lowering the concentration of the fat (table 2). All without adversely affecting the development of different forms of manifestation of physical qualities covered in that period (table 3).

Taking into consideration the above mentioned, we consider useful, for young players who are deficient in muscle mass, the introduction of training aimed to build muscle to optimal values. Depending on the needs of the subjects, this can be done over periods of 4-6-8 weeks, one or two times per year during the preparatory period. Of course, the implementation of such training for longer periods could harm (due to the intensity of submaximal loads, a relatively high number of repetitions and low speed execution) leading in the end to having players with well-defined musculation but slow.

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Bone mineral density in osteopenic early postmenopausal women practicing Pilates gymnastic for six years

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Abstract. Osteoporosis has a negative impact on health and is very frequent in women after menopause. Regular physical activity (PA) is known to reduce the bone loss associated with ageing across the lifespan. Aims: There are two aims of this study: (1) to compare the BMD values of an active female group at the end of the 5-th year with those at the end of 6-th year; (2) to compare the mineral bone density (BMD) in early menopausal women (50-65y), who followed a PA program twice a week, for 6 years with that of a similar group, who have not done any regular PA. Methods: 22 women recently entered menopause (56.53± 6.3 years, BMI 21.11±4.98 kg/m^2) who have participated for 5 years the Pilates type fitness program, (60 minutes, 2x/week) formed the activel group (AG), and the sedentary group (SG) - 25 women (56.98±3.40 years, BMI 22.4±4.8kg/m^2) with a sedentary lifestyle. Both groups underwent calcaneal ultrasound measurement with OsteoSysSonost 3000 device. Results: The bone parameters of the experimental group were the same, or have not changed significantly in the last year of physical activity. At follow-up (the end of the 6-th year) the bone parameters of AG and SG have generated significant differences favouring the active group ($p<0.01$). Conclusions: A Pilates fitness program of 12 months had not an impact on the BMD values of women in menopause, but BMD values did not decrease as expected in women of this age. Regular physical activity practiced over a six years period has led to greater BMD values for active early menopausal women than their sedentary peers.

Keywords: bone mineral density, physical activity, early postmenopausal women, Pilates, osteoporosis prevention

Introduction

Osteoporosis is one of the greatest challenges for a woman during menopause, and it usually starts after 3 or 5 years from the last menstrual cycle. It affects about 25-44% of women (Czeczuk et al., 2012). Women are most likely to be exposed to osteoporosis especially after menopause. The average age for reaching menopause in Europe is 50 years. Menopause is defined as a natural age-related decrease and, finally loss of ovarian estrogen production and secretion which affects the balance between the osteoclastic and osteoblastic activity. Demineralization happens at the vertebra level regardless of gender (Hăulică, 1999). The absence of estrogen hormones may provoke a rapid degradation of the cardiorespiratory fitness and muscular strength, BMD, weight gain all of which leads to an increased risk of chronic diseases (cardio-vascular, type 2 diabetes, osteoporosis, especially in those leading a sedentary lifestyle (Sowers & La Pietra, 1995).

Therefore, early post menopause (50 to 60 years of age) is an important phase in a woman's life with many risks, especially for physically inactive women.

Regularly physical activity practice represents a stress to the skeletal system and is crucial for reducing chances of osteoporosis especially in older people. Repetitive bone stress increases the bone density and lead to fluid and ion flows inside the bone channels, stimulating the bone mass, and regular moderate physical activity, contribute to increase bone density (Antonescu, 2006).

The strategy of decreasing the bone loss includes increasing and accumulating bone density during growth, optimizing the accumulation of bone density, maintaining the integrity of the skeletal system during adulthood and minimizing the loss of bone density after the age of 50 or post menopause[1].

There are a lot of correlations between gaining bone density and physical activity (Vella, 2014). Research was also done on athletes practicing volleyball, basketball, gymnastics and an increase in bone density was noticed due to practicing regular physical activity (Nickols-Richardson & O'Connor, 1999). Effects of physical activity on bone density are higher on female athletes who practice gymnastics than on those who practice swimming (Courteix et al., 1998).

There is a direct relation between bone mineral density, fitness and menopause (Hansen & Tucker, 2015). Positive results were noticed in female bones during menopause, especially at hip level, when practicing physical activity, mainly jumps (Zhao et al., 2016). Women with low bone mass at their peak period of bone loss (5 years' post-menopause) who exercised (≥2 high intensity exercise sessions per week and < 2 sessions per week) improved their bone strength comparing with sedentary women (Bilek et al., 2016).

Studies have shown that early post-menopausal women are trainable in terms of health related fitness, and they really need exercise for their health (Asikaine et al., 2004; Nurten et al., 2012), and BMD (Cheng et al., 1991), but there is not a lot of research showing the benefits of Pilates physical activity on bone density in this category of women. It was demonstrated that moderate physical activity, at least 30 minutes, five times a week, practiced for a longer period of time, is beneficial for bone health in menopausal women (Wee et al., 2013).

Physical therapy interventions for individuals with osteoporosis, or even osteopenia, should include: weight-bearing exercises, flexibility exercise, strengthening exercise, postural exercise, and balance exercise (Ille, 2011).

Pilates is "a system of exercises using special apparatus, designed to improve physical strength, flexibility, and posture, and enhance mental awareness"[2]. Therefore, because it fulfils all these recommendations for osteoporosis, we choose to use Pilates method in order to prevent the bone demineralization of osteopenic early postmenopausal women.

Aims

The first aim of our study was to compare BMD values in a group of healthy women, early post-menopausal between 50-65 years old, who followed a Pilates fitness program – 60 minutes, twice a week, for 6 years (AG) measured at baseline (the end of the 5-th year of training) with those measured at follow-up (at the end of the 6-th year of training).

Secondly, we aimed to compare the BMD of the active group (AG) with that of a similar group of women with the same characteristics but who have not practiced regular physical activity for 6 years – sedentary group (SG).

Material and methods

Subjects

The subjects of our study are 22 healthy women, early post-menopausal (2-10 years), mean age of 56.53± 6.3 years, BMI 21.11±4.98 kg/m^2, who have practiced a Pilates fitness program, for 5 years (60 minutes, 2 times a week). They gave their written consent to undertake the bone quality measurements with the OsteoSysSonost 3000 device. Moreover they were asked to consent to continue their Pilates fitness routine, for the following year, on the same schedule. After one year, the final evaluation took place, but only 15 women have met the criteria of 85% attendance and were included in AG. The sedentary group was formed of 25 women with the same characteristics (56.98±3.40 years old, BMI 22.4±4.8 kg/m^2). The selection criterion besides age and BMI was the lack of regular physical activity practice during the last six years and no chronic diseases. During the same week the sedentary women were as well tested with the same device.

Assessments

Low calcaneal ultrasound measurements (quantitative ultrasound, QUS) were done with the heel QUS ultrasound (Achilles Insight, GE, Lunar Corporation, Madison, WI, USA) (figure 1). The ultrasonometer bone characteristics measured were: Broadband Ultrasound Attenuation (BUA), Speed of Sound (SOS) and Stiffness Index (SI) (Ştef, 2015). Measurements were done on the dominant leg of each participant. Measurement reproducibility was set at 1.6% for BUA and 0.4% for SOS. Calculations were done on 10 subjects with systematic repositioning after every measurement. All ultrasound measurements were performed by the same operator. Identification for every subject was inserted into the machine. Echography gel was applied on the heel of every subject and the leg was placed in the device for accurate testing.

Figure 1. Achilles Insight, GE, Lunar Corporation, Madison, WI, USA
(http://www3.gehealthcare.com/en/products/categories/bone_health/quantitative_ultrasound/achilles)

Anthropometric measurements were taken according to the standard procedures described by the International Society for the Advancement of Kinanthropometry: ISAK (Marfell-Jones, 2006).

Subjects participating in the active group were measured at baseline and follow-up: height, weight, abdomen, and right thigh perimeters. Height was measured with a stadiometer, the vertical pole touching the heels, the butt channel and the spine between the shoulder blades, to the nearest 0.1 cm. The weight was measured with the same analogue scale, to the nearest 0.1 kg. The scale was checked before measurements were taken (at baseline and follow-up). Perimeters were measured with the measuring tape in the following areas: abdomen (in the narrowest area between the lowest part of the ribcage and the highest part of the iliac crest, on the midaxillary line, with a horizontal metric tape); thigh (at the half point between the knee and the inguinal area); shank (in the most voluminous area). BMI was measured using the well known formula G/T^2 (kg/m^2). Body fatness of participants was classified according to WHO standards: Underweight (BMI < 18.5 kg/m^2: ≤ 16.00 Moderate thinness < 16.99; 17.00 ≤ Mild thinness < 18.49), Normal (18.5 kg/m2 ≤ BMI < 25 kg/m2), Overweight (25 kg/m^2 ≤ BMI < 30 kg/m^2; 25.00 ≤ Pre-obese < 27.49), and Obese (BMI ≥ 30 kg/m^2)[4].

The training program aimed to increase the muscular strength and endurance of the postural muscles and those of the limbs. It also aimed to improve flexibility, posture and control. The general structure of the lessons followed the classic pattern: warm up, for about 15-20 minutes, with callisthenic exercises, for the major segments and muscle groups, the work-out lasted 30-35 minutes, was based on strengthening exercises focusing on the core muscles of the abdominal-lumbar-pelvic area based on Pilates principles: co-contraction exercises in elongation of the main postural muscles, using the body weight and various objects: large balls, medicinal balls of 2 kg, 1-2 kg weights, elastic bands. The third part, cooling down exercises (5-15 minutes) consisted on stretching exercises for the trained muscular groups.

Statistic analysis included descriptive statistics (the average and standard) for all anthropometric parameters. Data was arranged based on initial and final measurements. The statistical analysis of the variation of the bone and anthropometric parameters was done using ANOVA with multiple measurements (initial and after 12 months). The statistical significance was set at $p<0.05$. SPSS 10.1 was used to statistically analyze the data.

Results

All final results of the anthropometric parameters have slightly improved, but not significantly compared to the initial measurements in the AG (table 1). In the same group baseline T score (-2.29) indicates osteopenia (table 1). After one year, T score decreased (-2.27) but not significantly (table 2) and still indicates the presence of osteopenia, but none of the subjects has osteoporosis. A BMD measurement made at the same moment for sedentary women indicates the presence of osteoporosis for the whole group (T score = -2.79) (table 2). Bone density in active and sedentary groups measured at the end of the experiment showed significant difference in favour of the group that participated in physical activity for 6 years compared with the sedentary one ($p<0.01$).

Table 1. Characteristics, anthropometric values and bone mineral density of subjects of the active group, at baseline and follow-up.

Charactristics	Baseline (after 5 y of PA)	Follow-up (after 6 y of PA)	p value
Age (years)	56.53±6.3	-	-
Height (m)	1.69±0.007	-	-
Weight (kg)	60.5±13.4	60.4±12.7	ns
Thigh circumference (cm)	55.8±5.6	56±7.07	ns
Abdominal circumference (cm)	84.8±5.6	84.6±4.24	ns
Body Mass index (kg/m^2)	21.11±4.98	21.09±4.73	ns
BMD - T score	-2.29±0.47	-2.27±0.55	ns

Table 2. Bone mineral density measured at the end of the 6 years training – T score of the two groups, active and sedentary and the statistic difference between the two mean values.

Bone parameters	Active Group n=15	Sedentary Group n=25	p value
T score	-2.27±0.55	-2.79±0.55	0.001

Discussion

There are no significant differences on a morphologic level at the end of the 12 month training program. All the subjects were in the normal weight category. As studies shows, the physical exercise has minimal impact on the form and body composition on women who recently entered menopause (Ready et al., 1996).

BMD - Active group - initial versus final results

No BMD evaluation was done for the subjects from active group before the 5-th year of PA training. This first measurement of BMD revealed the presence of osteopenia. The follow-up measurements were done one year later, because it is known that at least 12 months of physical training are necessary in order BMD improvements to appear.

After a year of regular physical activity, there were little improvements of the bone parameters in the active group. But it should be noted when looking in the individual values, that they did not worsen from initial measurements to the final ones. Slight improvements or, at worst, stagnation are encouraging results, considering that the normal decline in people of this age group is of 0.3-0.5% every year (Tanna, 2005). Therefore, we could attribute the slowing down in the bone density loss of the women in EG to the regular participation in physical activity over 12 months. Moreover, it is shown that postmenopausal sedentary women could benefit from 30 minutes of walking every day, and a muscular endurance and strengthening program twice a week, with warming up and cooling down the body through stretching, with weight preservation, maintaining the bone mineral density and increasing muscle strength (Asikainen et al., 2004). Therefore, even though BMI, weight and other anthropometrical measurements did not changed after one year of physical training the results are considered beneficial for the health of these subjects, since worsening would have been expected according to physiological data.

Active group versus sedentary group

The bone parameters of the group that has been regularly participating in a Pilate's fitness program for over 6 years were significantly higher than those in the sedentary group, even though AG presented with osteopenia and SG with osteoporosis. Moreover, Angin et al., 2015, showed a significant increase in BMD values of menopausal women with osteoporosis who underwent a Pilate's program ($p < 0.05$), while BMD decreased in the control group ($p< 0.05$) who did not Pilates. This is partial true in our study, since the increase of BMD values was not significant in the training group. Anyway, we can conclude that in our study as well, the difference between the active (Pilates) group and sedentary group in terms of bone quality is caused by the first group being involved in a physical activity for over 6 years.

Rianon et al., 2012 concluded in a study made on 2682 women that lifelong physical activity with continuation into old age (≥65 years) best maintains better bone health in the elderly. Other 16 years follow-up study (Kemmler et al., 2016) on early-postmenopausal females with osteopenia found that the minimum effective dose of exercise that relevantly addresses BMD averaged around two sessions/week, which indicates that even when applying high impact/high intensity programs, exercise frequency and its maintenance play a key role in bone adaptation. Our results sustain the findings of the two mentioned studies and considering their results, we could conclude that sedentary and active perimenopausal women should be encouraged to engage in-, respective to continue with- regular lifelong PA.

Conclusions

Regular participation in a physical activity for over 6 years has lead to greater BMD values in women who have kept active over the years compared to the sedentary ones.

Participating in Pilates fitness program, for 12 months has not significantly improved the BMD values in early post-menopausal osteopenic women, but they have also not decreased as it would have otherwise been expected at this age.

Regular practice of Pilates Exercises in osteopenic early post-menopausal women over six years is effective to slow down the natural decrease of BMD, and consequently to prevent osteoporosis. Physical educators, fitness trainers, physiotherapist can use Pilates Exercises for preventing osteoporosis in early post-menopausal women, or even earlier.

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Spatial characteristics of sports-related non-profit organisations in Hungary

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Abstract. The primary aim of the present work is to analyse the spatial characteristics of non-profit organisations working in the field of sports in Hungary according to three aspects (number of organisations, revenues and employment conditions of organisations). The most important conclusions of the paper are the following: studying the characteristics of non-profit organisations indicating sports as their main activity at different settlements, the settlements with higher number of inhabitants are in better positions; within the whole non-profit sector sports-related non-profit organisations are overrepresented in smaller settlements; considering factors determining distribution at settlement level, strongest correlation was found to income conditions.

Keywords: non-profit organisation, sports, Hungary, spatial characteristics, determining factors

Introduction

The increasing social-economic-political significance of sports could be observed in Hungary in recent decades therefore research focused on institutions that have important roles in sports-related activities. Such organisations can be classified into three major – overlapping from certain aspects – groups (Hoye et al., 2015):

- public sector: central and local governmental organisations that have important roles in forming development concepts apart from control;

- commercial or professional sports organisations: profit-oriented sports clubs, companies operating sports establishments, media companies;
- non-profit or voluntary sector: organisations based on local communities, national professional sports associations.

Significance of the latter group increased in the last decade from several points of view. On the one hand, increasing of the civil sphere is general and appears in sports as well. On the other hand, nowadays the society pays increasing attention to healthy life an outstanding element of which is sport. Organisation of activities associated with them is, however, truly effective if organisations closest to the inhabitants are involved as well.

As a result of the above, the target group of research associated with sports was non-profit organisations. Studies explored – among others – the most important features of their operation and the characteristics of those working for them (e.g. Misener & Doherty, 2013; Wicker & Breuer, 2013; Sparvero & Kent, 2014; Bang, 2015; Nowy et al., 2015; Wicker & Frick, 2016).

A significant disadvantage of the research, however, is the fact that they treated non-profit sport organisations as one single unit and much less attention was paid to exposing differences among regions or settlements that could improve significantly the understanding of the processes (Ilieş et al., 2014).

Based on the above, the primary aim of the present work is to analyse the spatial characteristics of non-profit organisations working in the field of sports in Hungary according to three aspects (number of organisations, revenues and employment conditions of organisations). The paper also describes the differences among them according to the host settlements and exposes the reasons behind these differences.

Materials and methods

Selection of the related non-profit organisations (indicated sports as their main field of activity based on Hungarian NACE code) for studying their regional differences was based on the data for the year 2013 of the Cég-Kód-Tár (Company Code Register) published by the Hungarian Central Statistical Office (HCSO). According to the Hungarian NACE, eight activities are related directly to sports: operation of sports establishments, trade of sports equipment, loan of leisure and sports equipment, sports and leisure training. Analysis of data was performed using the software SPSS while maps were made using the ArcView software.

Results

Non-profit organisations have had an important role in the sports life of Hungary for a long time and this can be explained by several factors. On the one hand, numerous fencing, shooting, gymnastic and athletic clubs were formed before World War II involving primarily the high-profile members of the society (Bukta, 2005). On the other hand, between 1945 and 1990 – besides the almost complete elimination of certain fields of the sector – sport was one of the activities where civil organisations remained (Bukta, 2013). These associations, however, were operated with significant political control with only one or two exceptions (e.g. chess, hiking)

(Bakonyi, 2007). Considering the above, it is not surprising that – despite the apparent decline due to the economic recession from the second half of the 1970s – more than 1/3 of the non-profit organisations were organisations dealing with sports prior to the political regime change (fig. 1).

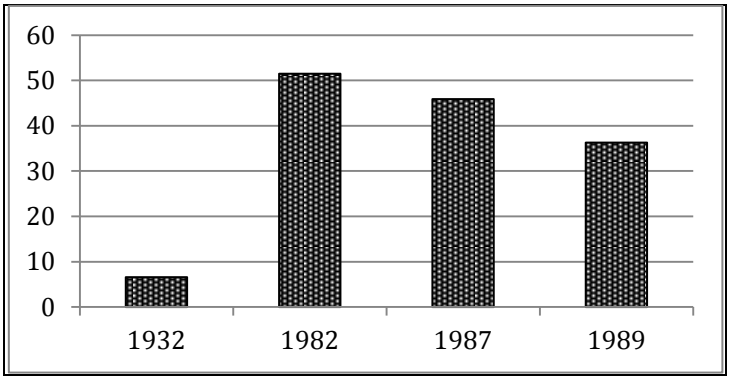

Figure 1. Ratio of sports organisations within all organisations over the 20th century (Source: Bocz, 2009, 125)

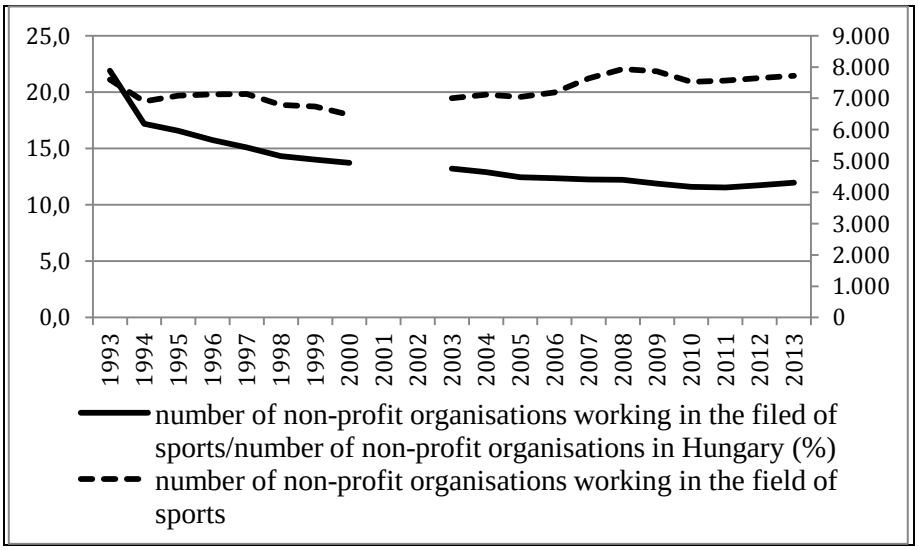

Figure 2. Most important factors of sports-related non-profit organisations between 1993 and 2013 (data of the HCSO for 2001 and 2002 were based on representative data surveys therefore they are not reliable)(Source: Balogh et al., 2003; KSH, 2014b; www.ksh.hu)

Studying the time period after the regime change (fig. 2) sports organisations were stagnating regarding absolute numbers (slight increase can be observed in the new millennium) while their ratio regarding the whole sector of non-profit organisations was decreasing slightly (Bukta, 2005; 2013). A high number of non-profit organisations were closed because of financial difficulties due to the crisis among state companies that could provide the financial basis for the associations prior to 1990. This process was only partly counterbalanced by organisations and

foundations formed in the fields of leisure and new sports (e.g. fitness, American football, curling). Furthermore, with complete political freedom and the increase of tasks less covered by the state (e.g. social supply) the number of civil organisations increased significantly at national level.

Analysing the regional conditions of the related organisations (table 1) several clear tendencies can be observed. Regarding the values for one thousand people, a gradual increase can be seen after the bottom value characteristic for the category of 3–5 thousand people followed by a decrease after the top values for the category of 50–100 thousand people. It is worth noting that greatest ratio of the studied organisations with the whole non-profit sector operate in the smallest settlement category. This can be explained by the fact that education and cultural organisations that are important in the field of non-profit organisations are not present at these settlements therefore their role are taken over by organisations working on sports and leisure time utilisation.

Table 1. Characteristics of sports-related non-profit organisations at settlements of different size in Hungary in 2013

size of settlements	A	B	C
less than 1,000 inhabitants	129.91	101.50	14.00
1,000 – 2,999 inhabitants	106.14	82.93	14.79
3,000 – 4,999 inhabitants	94.26	73.64	13.57
5,000 – 9,999 inhabitants	104.31	81.49	13.58
10,000 – 14,999 inhabitants	112.76	88.10	12.13
15,000 – 24,999 inhabitants	112.94	88.24	10.39
25,000 – 49,999 inhabitants	156.68	122.41	11.45
50,000 – 99,999 inhabitants	175.49	137.11	10.41
100,000 – 250,000 inhabitants	137.00	107.04	8.01
Budapest	145.53	113.70	6.84

A – number of sports-related non-profit organisations by 100 thousand people (pieces) in settlements of different size, B – ratio of sports-related non-profit organisations by 100 thousand people (pieces) in settlements of different size compared to the national value (%), C – ratio of related non-profit organisations compared to the whole non-profit organisations (%)
Source: KSH 2014a

Studying employment conditions according to settlement size (table 2) no major trends can be identified: best values are characteristic for the categories of 1–3 thousand and 100–250 thousand people (almost the two extreme values). Based on the calculated values, comparing the data of the related organisations to that of the complete non-profit sector lower values are obtained for all categories except for the group of 100–250 thousand people and for Budapest. This fact suggests that employment strength of the sports-related non-profit organisations at smaller settlements is smaller than that of the whole non-profit sector (however, it exceeds the national average) and opposite trends are characteristic for only the largest settlements. This could be explained primarily by that the centres of the national professional organisations (e.g. Hungarian Handball Federation, Hungarian Football Federation) employing a high number of employees are in Budapest and non-profit organisations employing a high number of people operating sports establishments owned by local governments are also found mostly in larger settlements.

Table 2. Employment conditions of sports-related non-profit organisations in settlements of different size in Hungary in 2013 (%)

	A	B	C	D	E	F	G	H	I	J	K
0 employee	50.3	44.5	49.5	49.9	48.5	51.3	53.0	57.2	51.8	62.2	52.8
1 employee	48.6	54.5	49.3	48.4	50.6	46.5	45.2	42.0	46.1	36.2	45.7
2 employees	0.3	0.4	0.4	0.3	0.0	0.5	0.4	0.0	0.2	0.4	0.3
3-4 employees	0.1	0.2	0.2	0.7	0.0	0.3	0.3	0.2	0.5	0.3	0.3
5-9 employees	0.3	0.2	0.4	0.3	0.4	0.5	0.3	0.1	0.3	0.5	0.3
10-19 employees	0.5	0.2	0.2	0.3	0.4	0.6	0.5	0.2	0.6	0.2	0.4
20-49 employees	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.1	0.2	0.2	0.1
50-99 employees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1
100-149 employees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
150-199 employees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200-249 employees	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total value	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
calculated value	100.7	103.7	100.8	102.5	101.6	102.3	100.7	96.0	103.1	94.0	100.0
calculated value – in case of all sector	101.3	105.1	108.0	110.4	105.5	106.5	102.8	96.8	101.0	91.5	100.0

A: less than 1,000 inhabitants, B: 1,000-3,000 inhabitants, C: 3,000-5,000 inhabitants, D: 5,000-10,000 inhabitants, E: 10,000-15,000 inhabitants, F: 15,000-25,000 inhabitants, G: 25,000-50,000 inhabitants, H: 50,000-100,000 inhabitants, I: 100,000-250,000 inhabitants, J: Budapest, K: Hungary

calculated value – value obtained by weighted adding of data belonging to the various employment categories compared to the national values (%)

Forrás: KSH 2014a

Analysing the revenue of the organisations (table 3) clear differences among the studied settlements can be observed: organisations operating in larger settlements have better conditions than those at smaller settlements. High values for Budapest are especially outstanding. This can be explained by the already mentioned fact that the national professional associations operating in Budapest that organise the activities of certain fields of sports receive great income from various sources (e.g. state support, sponsorships).

Analysing the factors influencing the distribution of related organisations according to settlements (table 4) closest correlation (increasing values with increasing relative number of organisations) can be detected in the case of domestic income per inhabitant while poorest correlation can be detected in the case of net revenue of selling per inhabitant. Conclusions drawn from the data of the table are supported by Pearson's correlation coefficient as well the value of which is greatest in the case of domestic income per one inhabitant (although this is still smaller than 0.1 but indicates also significant correlation at 0.01 level) and smallest in the case of the net revenue of selling.

Table 3. Revenue conditions of sports-related non-profit organisations in settlements of different size in Hungary in 2013 (%)

	A	B	C	D	E	F	G	H	I	J	K
0-20 million HUF	99.3	99.6	99.3	97.7	98.5	97.6	97.0	97.2	96.8	94.6	97.4
21-50 million HUF	0.4	0.3	0.2	0.5	0.5	1.0	1.7	1.7	1.5	1.8	1.1
51-300 million HUF	0.1	0.2	0.5	1.7	1.0	1.0	1.0	0.9	1.3	3.3	1.3
301-500 million HUF	0.1	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.2	0.3	0.1
501-700 million HUF	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.1	0.1	0.0	0.1
701-1,000 million HUF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,001-2,500 million HUF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
2,501-4,000 million HUF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total value	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
calculated value	95.8	95.0	95.8	100.5	97.6	100.2	100.3	100.7	101.2	106.5	100.0
calculated value – in case of all sector	94.8	94.9	98.5	101.0	100.3	100.2	100.6	98.5	100.2	103.2	100.0

A: less than 1,000 inhabitants, B: 1,000-3,000 inhabitants, C: 3,000-5,000 inhabitants, D: 5,000-10,000 inhabitants, E: 10,000-15,000 inhabitants, F: 15,000-25,000 inhabitants, G: 25,000-50,000 inhabitants, H: 50,000-100,000 inhabitants, I: 100,000-250,000 inhabitants, J: Budapest, K: Hungary

calculated value – value obtained by weighted adding of data belonging to the various employment categories compared to the national values (%)

Forrás: KSH 2014a

Table 4. Average of the values per 100 thousand people of sports-related non-profit organisations in settlements with different social and economic factors in 2013

	A	B	C
first seventh	64.3	79.2	94.6
second seventh	81.7	98.8	149.8
third seventh	94.2	96.9	96.1
fourth seventh	103.7	131.7	101.5
fifth seventh	128.0	130.2	113.2
sixth seventh	135.0	138.7	109.4
seventh seventh	144.9	140.4	141.3

first seventh – settlements with the worst values regarding the given factor, seventh seventh – settlements with the best values regarding the given factor, same number of settlements belong to each seventh

A – domestic income per one inhabitant, B – unemployment rate, C – net revenue of selling per one inhabitant

Source: KSH, 2014a; TEIR

Studying the strength of the sports-related non-profit organisations in the case of settlements larger than 10 thousand inhabitants (fig. 3), two major centres can be identified: the central and southern part of Transdanubia (e.g. Szekszárd, Balatonfüred, Kaposvár, Bonyhád, Paks) and Northern Hungary (e.g. Gyöngyös, Eger, Tiszaújváros, Salgótarján). There is a belt of settlements with low values in the central

region of Hungary striking west–south (e.g. Csorna, Dorog, Mór, Bicske, Cegléd, Kisújszállás, Tiszaföldvár) involving both developed and underdeveloped regions.

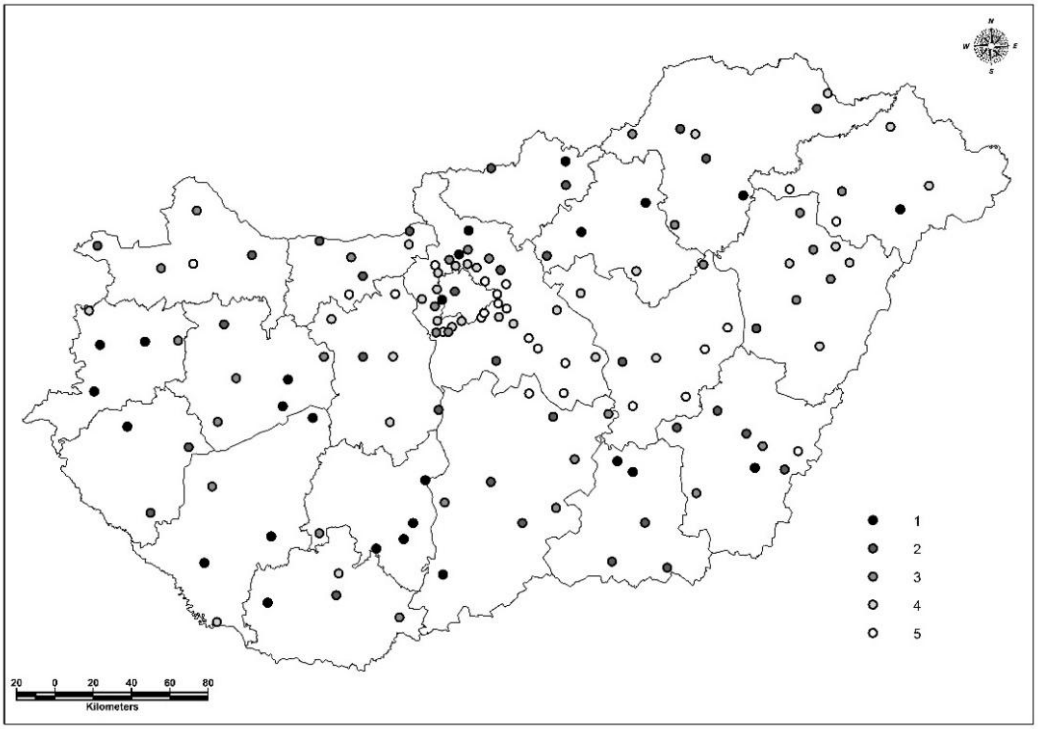

Figure 3. Rank of strength for the studied Hungarian settlements regarding sports-related non-profit organisations in 2013
(the maximum value – Szekszárd – in percentage, dividing settlement number into equal parts, 1: 54%-100%; 2: 46%-53%; 3: 33%-45%; 4: 25%-32%; 5: 0%-24%)
(Source: KSH, 2014a)

Certain relationships can be identified when the factor indicating the significance of sports-related non-profit organisations are compared to factors indicating economic development (Table 5): in most cases lower sports strength values belong to decreasing values of the latter factor.

Table 5. Average values of factors indicating the social and economic development of the studied settlements compared to the strength of sports-related organisations in 2013

	A	B	C
first sixth	962.7	5.28	9,437.3
second sixth	892.4	5.50	9,141.0
third sixth	892.7	4.97	6,330.9
fourth sixth	832.1	6.01	6,189.1
fifth sixth	900.1	6.18	4,529.3
sixth sixth	765.1	5.80	4,823.8

A – domestic income per one inhabitant (1,000 HUF/person), B – unemployment rate (%), C – net revenue of selling per one inhabitant (1,000 HUF/person)
Source: KSH, 2014a; TEIR

Conclusions

The most important conclusions of the paper are the following:

Studying the characteristics of non-profit organisations indicating sports as their main activity at different settlements, the settlements with higher number of inhabitants are in better positions.

Within the whole non-profit sector sports-related non-profit organisations are overrepresented in smaller settlements.

Considering factors determining distribution at settlement level, strongest correlation was found to income conditions.

Acknowledgement

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Football and economy before and after communism in Romania

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Abstract. The present study aims at identifying the relations between football and the Romanian economy before and after the communist period (1986 - 2005). This study was based on bibliographic analyzes and analytical interpretations, in time and space, of the information regarding the number of teams in League III and of the relationships they develop with the economic environment. The results reflect the profound mutations that economy and sports has experienced during the passage of the Romanian society from a communist society to a capitalist one. The indissoluble link between football and the economic environment is evident especially for teams in League III.

Keywords: football, football dynamics, League III, sports

Introduction

Since its consolidation as a sport, football has become a global phenomenon that engages a record number of participants and socio-economic activities around it. Football is an inseparable part of society, while its value is being given by the degree and level of involvement of each member (Ilieş et al., 2014a). The introduction of new concepts in sports cultural context (Bale, 2003; Conner, 2014; Dragoş, 2015), supported and argued by various studies (Ilieş et al., 2014b; Kozma,

2014) and generalizations (Szabo-Alexi et al., 2008), give a distinctive character to sport, in general, and to football, in particular.

During the period that we have studied, football activity had two forms of organization: on amateurism principles (before December 1989) and on professionalism principles (after December 1989). In 1992 the Romanian Football Federation[1] was established, respecting all the international provisions and agreements, and in 1993, following the transformation of football into a professional sport, also the Professional Football League was founded[2]. In Romania, before 1989 League I football clubs functioned mostly in big county cities, being financed almost exclusively by the municipality and by some economic agents. Today, the same form of funding is preserved, although the form of social organization has changed.

Before 1989, the clubs in the 2nd league, but especially the ones in the 3rd league functioned in addition to the big communist enterprises. After December 1989 those clubs made their transition to professional ones, which generated extensive disputes and controversies, and most of them disappeared (mostly as a result of the economy transition from communism to capitalism). Series of clubs disappear (some traditional ones, like: Rapid Bucharest, etc.) and new ones appear (Buhaş, 2015a). However, football remains a social phenomenon that engages a huge number of participants, both from the perspective of the athlete or spectator (Socol, 2016). This sport gives the chance for everyone to practice it, regardless of their ethnicity, religion or social status. It strengthens the need for cooperation, stimulates the human capacity to transform and adapt to specific situations (Buhaş, 2015b). The importance of this phenomenon is also evidenced by the emergence of sports publications, especially about football (Gazeta Sporturilor, etc.), as well as of TV channels where football is widely represented (Digi Sport, Eurosport, Sport.ro).

After the events in 1989, football is experiencing in Romania a wide process of reorganization. This fact is conditioned by the profound socio - economic changes that took place in the Romanian society. The stability from the Communist period (with all its deficiencies) disappears, leaving space for instability and uncertainty. There are very pronounced fluctuations in what regards the organization and conduct of competitions in all three leagues. The economic factor has a great impact in this regard. Football needs funding, and society, through its economic component, can not provide it. This instability has led to the disappearance of some great Romanian traditional football teams (Universitatea Craiova, Petrolul Ploieşti, F.C. Maramureş Baia Mare). The reorganization of the economic development poles has led, on the other hand, to the emergence of some new teams that culminated with outstanding sport results (FC Vaslui, Unirea Urziceni, etc.).

The most obvious changes can be seen in the 3rd league. If in League 1 and partly in League II the funding comes mostly from local administrations (the teams perform in big cities - county residence), in the 3rd League the transitions and mutations were profound and dramatic. The stability of the teams that performed in addition to big enterprises was shattered by the socio-political transformations after 1989. The transition from communism to capitalism (a phenomenon that is still going on) generated the disappearance of a large number of enterprises, and of a multitude of teams that were funded by them. The transformations and changes that took place

during the transition period have changed the poles of economic power and, implicitly, the football activity.

Using specific research methods, our study approaches from the above mentioned perspectives, the causality and the link between the socio - political - economic transformations and the stability and dynamism of football teams in League III.

Methodology

Although the two aspects, "football" and "economy", seem unrelated, between them there are close interconditionality relations, which result both from the way in which this sports activity is funded, but also from the way football represents and promotes a community of people and, implicitly, its activities. Before and after December 1989, sports, in general and football, in particular, needed funding to exist and function. We will see that between the two mentioned periods there are fundamental differences in what regards both financing and organization.

The present study reflects the results of bibliographic research and analytical interpretations, in time and space, of the information regarding the number of teams and the relationships they develop with the economic environment before and after December 1989. Using the cartographic method, intensively used in geography as well as in other fields of study, based on ArcGis 9.3, a series of specific analyzes were carried out regarding the spatial and temporal distribution of football teams in League III taking into consideration Romanian districts and historical regions (Grama et al., 2016; Herman et al., 2016a, 2016b, 2016c; Herman et al., 2017; Ilie et al., 2017; Ilieş et al., 2016a, 2016b, 2016c, 2016d; Loghin et al., 2017).

Therefore, having an overview of previous analyzes, we have come to identify some relations between football from League III and economy. In this sense, we considered as case studies 3rd league football teams from Bihor county, namely from the city of Oradea and Ştei area (which, during the communist period, was known as Dr. Petru Groza city). By extrapolating the results obtained for the two case studies at the county, historical and state level, and based on spatio-temporal models related to the number of teams, we will highlight a synthetic and general picture of the relationship between Romanian football and economy before and after December 1989.

Results and discussion

The spatio-temporal analysis of the number of football teams in League III

The temporal analysis implied the observation of comparative evolutions of both the number of League I, II and III teams at national level and historical regions, and of the number of League III teams at the level of Romanian historical regions (fig. 1-5).

The situation of the 3rd Legaue Romanian football before and after December 1989 is highlighted from the spatio-temporal analysis of the number of teams that performed in the 3rd League during the period 1986-2005. It reveals a number of quantitative (the number of teams, their share) and qualitative (functional causal relationships) aspects.

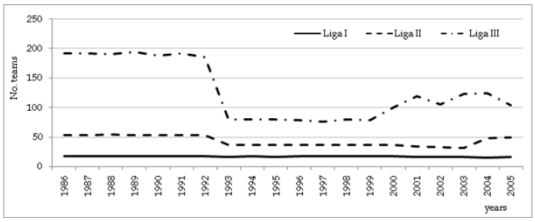

Figure 1. The comparative evolution of the number of League I, II and III teams, in Romania

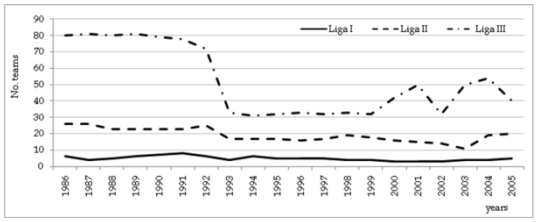

Figure 2. The comparative evolution of the number of League I, II and III teams, in Transylvania

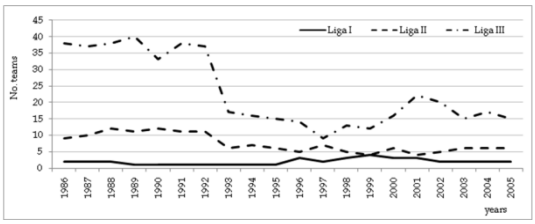

Figure 3. The comparative evolution of the number of League I, II and III teams, in Moldova

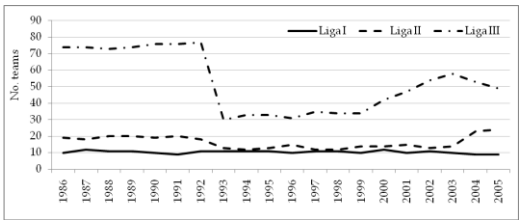

Figure 4. The comparative evolution of the number of League I, II and III teams, in Wallachia

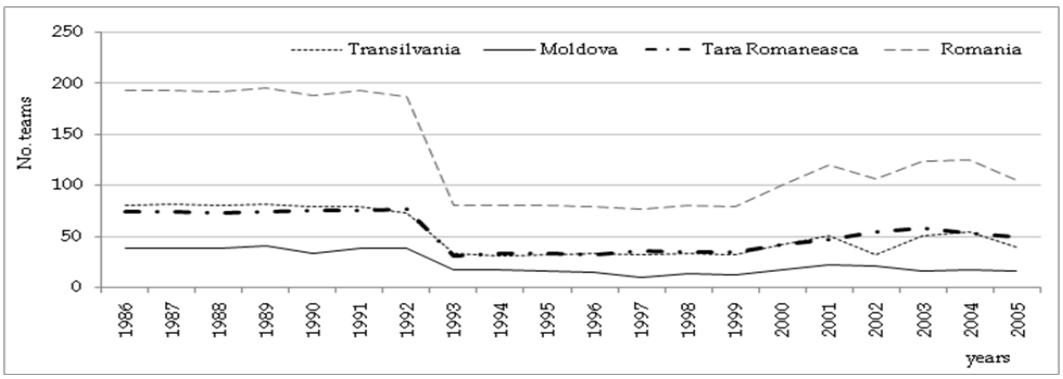

Figure 5. The comparative evolution of the number of League III teams, at national and historical level

The comparative evolution of the number of League I, II and III teams in Romania and its historical regions during the period 1986-2005 reveals the existence of major differences in what regards the interval (at league level) within the limits of which the number of Romanian football teams have oscillated in the mentioned time frame. Thus, the biggest differences were recorded at the level of the 3rd league, while the lowest oscillations were registered at the level of League I (fig. 1-4). The explanation of these oscillations comes from the way in which the competitions are organized (the regulation) and from the specific economic situation, especially for the teams in the 3rd league.

From the comparative analysis of the number of the 3rd League teams at national and historical regions level (fig. 5), one can differentiate three distinct time

intervals: 1986-1992; 1993-1999; 2000-2005. The first two time intervals were defined by the existence of a relative stability, characterized by small fluctuations in the number of football teams performing in League III. The difference between the two above-mentioned time intervals was quantitative, so the first time interval (1986-1992) was characterized by the existence of a large number of teams in the 3rd League (186-192 teams), while, in the second time interval (1993-1999) their number decreased, ranging from 76 to 80 teams. Although the number of football teams in the 3rd League has increased, after the year 2000 their number remains unstable, ranging from 100 to 124 teams (fig. 1). This is also due to the fact that the organizational and competitive system is characterized by a constant fluctuation, both because of clubs` financial instability and economic fluctuation.

Regarding the comparative evolution of the number of League I, II and III teams at historical regions level (Transylvania, Moldova and Wallachia), the situation is relatively similar to the one existing at national level (fig. 2-4). The socio - economic conditions are relatively uniform throughout Romania until the mid - 1990s. After this period, with the transition of the economy to capitalism, but also with the accession to the European Union and implicitly to European funds, at the level of Romanian historical regions an economic development difference appears. Implicitly, football activity has to suffer from the financial perspective.

The spatial analysis involved some quantitative analyzes based on the total number of teams qualified in League I between 1986 and 2005, at county and historical region level. A cartogram was made at county level representing the spatio-temporal evolution of the number of teams qualified in League III in the above-mentioned time intervals, by using different coloured columns (each column represents one year: 1985/1986, 1989/1990, 1994/1995, 1999/2000, 2004/2005). At the same time, by using the Quantities Graduated Colors method (5 value classes, 23-50 teams, 51-80 teams, 81-100 teams, 101-120 teams, over 121 teams), the spatial evolution of the total number of teams at county level for the period 1986-2005 is also highlighted. In order to perform a comparative analysis, the total number of qualified teams during the interval 1986-2005 at county level is represented in a graph (fig. 6).

From the spatial distribution at the county level of the total number of qualified teams in the 3rd League for the period 1986-2005, one can notice the predominance of intensively industrialized areas: Bucharest (137 teams), Hunedoara (114 teams), Gorj (103 teams) Bacău (102 teams) and Prahova (101 teams), while at the opposite side we notice areas where the industry was still developing: Botoşani (29 teams), Bistriţa-Năsăud (30 teams), Giurgiu (34 teams), Mehedinţi (36 teams) etc. The longitudinal analysis at county level regarding the number of qualified teams in the 3rd League revealed a relatively similar situation to the one recorded at historical region and national level, defined by the existence of three time intervals (1986-1992, 1993- 1999, 2000-2005) with their specific characteristics in what regards both the number of teams qualified in the 3rd League and the economic situation based on which they can be supported (fig. 1-6).

At historical region level, the share of the number of qualified football teams in the 3rd League during 1985/1986, 1989/1990, 1994/1995, 1999/2000, 2004/2005,

and respectively 1986 -2005 was analyzed (fig. 7). The results of these analyzes come in addition to those obtained at the county level, strengthening the image highlighted based on spatial analyzes. Thus, it can be noticed that the share of the qualified teams at historical regions level, in different time periods and for the whole time interval, remained relatively constant, with small changes, although the number of teams over the mentioned time intervals has been subjected to profound mutations (fig. 5 and 7).

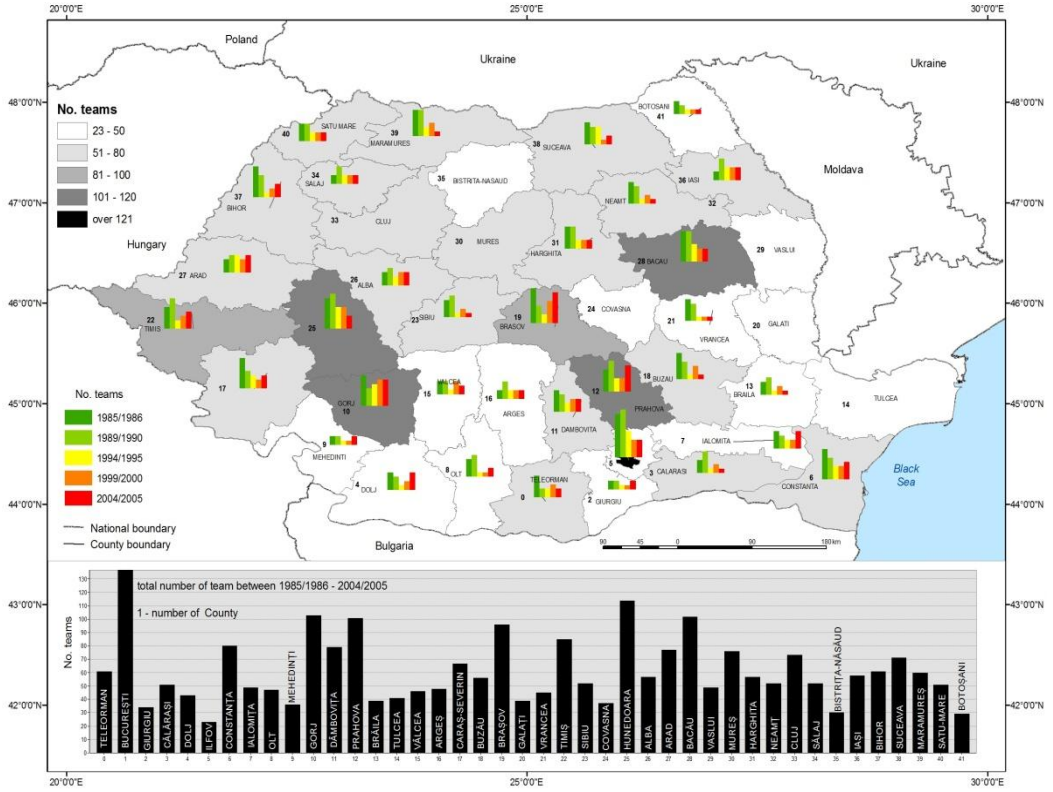

Figure 6. The distribution and dynamics of teams in League III at county level between 1986 – 2005

Links between 3rd League football and Romanian economy

In our analysis we start from the comparative situation of the total number of teams from all three leagues on certain time intervals. Thus, according to figure 1, we notice that the number of teams in League 1 is mostly constant during 1986-2005. The explanation for this situation is the fact that these teams are located in big cities which are county residences. This aspect had a positive influence due to the fact that funds were provided from the municipality budget, with small adjustments coming from economic agents. Another factor that ensured the constancy of their number, is related to football regulation. This was correlated with the European regulation, where the number of teams in the first League varies between 16 and 20.

In what regards League II, we notice a similar situation. The number of teams vary because the teams are located either in the county seat or in the major cities of the country. Funding is provided both by municipality and by some economic agents. Also, the regulation is correlated with the European one, where the number of teams ranges between 16 and 20, organized on 1 - 2 series.

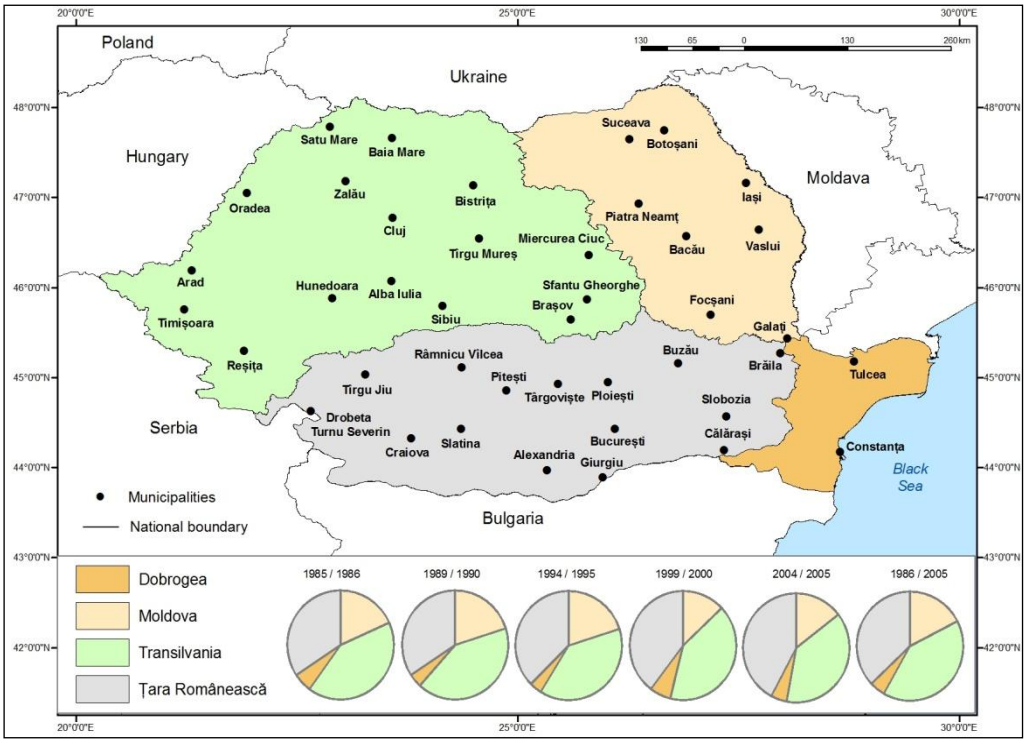

Figure 7. The distribution and dynamics of teams in League III on historical regions between 1985 – 2005

Fundamental differences are highlighted in what regards the 3rd League. One can notice three distinct periods from the graphs presented above: 1985-1992; 1993 - 1999 and 2000-2005. During the first period, which corresponds to the communist period and first years after the revolution when things were still unclear in the Romanian society, the number of teams in the 3rd League is constant. The same constancy is observed in the case of 3rd League teams at historical regions level. Since the events in 1989, Romania's socio - political and economic situation is changing dramatically. Our country makes its transition from the centralized communist system to the decentralized capitalist system. Both, economy and society are not prepared to cope with all the changes. Figure 1 shows a dramatic decrease in the number of teams - more than half. The same situation is highlighted in the old historical regions (fig. 2, 3 and 4). After the transition to capitalism and with a more pronounced stability of the country, starting with the year 2000, we notice a rebound of the 3rd League teams. Their number starts to increase, but it will never reach its "glory" achieved between 1986 and 1993.

According to the literature in the field, a case study conducted in Bihor county showed that things were similar. Between 1985 and 1992, nine teams represented Bihor in the 3rd League (Înfrăţirea Oradea, Voinţa Oradea, Oţelul Ştei, Minerul Ştei, Gloria Beiuş, Minerul Şuncuiuş, Unirea Valea lui Mihai, Recolta Salonta şi Bihoreana Marghita)[3]. These teams were active in addition to specific enterprises that were funding them. During this period, in the 3rd League there were 12 series of 16 teams. Between 1993 and 2000, the companies that financed the teams were restructured, their financial power dropped considerably because they were trying to adjust to the capitalist economy. With the bankruptcy of these enterprises, the football teams financed by them were either abolished (Voinţa Oradea), or they performed in inferior leagues without claiming a promotion.

At national level the situation was similar. Between 1993 and 2000, the number of teams in the 3rd League decreased dramatically. From a championship with 12 series of 16 teams, there were left only 4 series of 20 teams.

During this period, the Romanian industry collapses in all its sectors. The mining industry (Hunedoara, Gorj, Baia Mare, Târgu Jiu, Bihor, Alba Iulia) closes its doors. The majority if football teams are also in these areas (Hunedoara 114, Gorj 103, etc.). The oil and natural gas industry is facing a pronounced reorganization (Prahova, Buzău). This segment also finances a a series of teams (Prahova 101). The light industry is also collapsing (Suceava, Piatra Neamţ, Bacău, Botoşani).

Starting with Romania's adherence negotiations to European Union, the economic situation gives signs of stability. The private environment is reorganizing, sustaining the emergence of economically stable companies. Their level of development has allowed investors to enjoy sport pleasures, as well. Thus, the number of teams in the 3rd League began to increase, and the championship enlarged, reaching 8 series of 13 teams. The number of teams has never been constant since, depending on investors` financial possibilities.

In figure 7 we notice that over time, certain areas have developed more than others. The economy started to develop especially in Bucharest area. The same thing happened in Prahova, Craiova, Timişoara, Cluj, situation which attracted investments also in sports, helping some teams from the 3rd League to reach incredible performances (CFR Cluj, Unirea Urziceni, Astra Ploieşti). Areas where the economic development is delayed (especially in Moldova and the Center of the country) are not sufficiently represented in what regards sport performance, and also at the level of the 3rd League.

From the information presented before we notice a decisive link between Romania`s socio - economic development and the football activity at the level all 3 Leagues, regardless the historical period or social order. If for the first two Leagues the lack of fluctuation is largely generated by the regulation, for the 3rd League the economic factor is decisive, so it has led even to the change of competition rules (by reducing the number of series and teams).

Conclusions

Football, through its spreading, impact, and various relationships developed with the economic sectors, has become a central element for human collectives, that

requires an extensive and in depth research in order to identify the mechanisms that have led to its emergence, dynamism and functionality. Practically, in one way or another, the entire society is passively or actively, directly or indirectly involved in what is a mass sports phenomenon called football.

Hence, the present study aims to uncover the links and relations between football and economy in a difficult transition period between two different economic systems, namely between the communist and the capitalist system. The analyzes regarding the spatio-temporal evolution of the number of football teams in the 3rd Romanian League before and after December 1989 showed, as in the case of the economic mutations, profound changes also in the case of football actovoties, characterized by: the existence of major differences regarding the interval (at League level) within which the number of Romanian football teams has varied; the existence of three distinct time frames: 1986-1992; 1993-1999; 2000-2005, defined by the number of teams in the 3rd League at national and historical regions level; the predominance of intensively industrialized areas: Bucharest (137 teams), Hunedoara (114 teams), Gorj (103 teams), Bacău (102 teams) and Prahova (101 teams), while at the opposite pole counties with anunder-developed industry were situated: Botoşani (29 teams), Bistriţa-Năsăud (30 teams), Giurgiu (34 teams), Mehedinţi (36 teams), etc.

The spatial distribution of football teams numerically overlaps with areas of economic development, regardless the time period. The sport phenomenon and football, in particular, is indissolubly linked to regional economic development.

The global penetration of the football phenomenon is closely related to the economic development. Football becomes itself a profitable industry.

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Investigations concerning the influence of sports trainings carried out in a protected area (Natura 2000 site) on various physiological and biological parameters for athletes

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Abstract. The study propose a comparative analysis of biochemical and physiological parameters and their dynamics in athletes training in two different locations: the campus stadium in the Oradea University and a protected area- Valea Roşie Natura 2000 site. The research was conducted between 31st of May 2016 –9th of June 2016 on the players of a female volleyball team of Oradea's University Sport Club, aged between 18 and 24. We used

Polar RC3 heart rate monitor, monitoring: distance travelled in each exercise, duration, calories consumed, heart rate, minimum and maximum altitude. After the effort, biological samples were taken, analysing the following indices: Creatine kinase (CK), Lactate dehydrogenase (LDH) and Sideremia; the data interpretation and the results highlighted that organizing outdoor trainings in sites like Natura 2000 has a favourable influence on the biochemical parameters, had a contribution to "breaking" the routine and being a motivating factor for athletes in their activity.

Keywords: female volleyball team, blood samples, Creatine kinase, Lactate dehydrogenase, Sideremia

Introduction

The training conditions, the motivation of athletes, the environmental factors or air quality are elements that significantly contribute to the athletic performance of a sportsperson (Dragoş, 2014). The benefits of sports practicing and recreational activities in different environments were debated and researched over time, studies being made even for elderly (Cauwenberg et al., 2011; Zadarko et al., 2011, Ilieş et al., 2017, Portegijs et al., 2017; Zijlemaa et al., 2017) are also mentioned (Baltaretu, 2012, Turk 2016, Herman a., 2016, Herman b., 2016) other activities of this kind carried out in protected areas. Furthermore, physiological and biological effects of practicing physical exercises have been investigated in a series of specific papers (Brancaccio et al., 2006; Brancaccio et al., 2007; Baird et al., 2012, Jastrzębski et al., 2015).

Based on the existing ideas, in alliance with the desire to create the premises for a future research in this direction, we proposed a pilot study in order to establish the influence of the environment on some physiological and biochemical parameters relevant in assessing the training of professional athletes.

Thus, in order to achieve this objective, we hypothesized that the physical effort undertaken during training and therefore the effort and biochemical parameters can be influenced by environmental conditions and air quality.

The main objective can be summarized in an comparative analysis of biochemical and physiological parameters and their dynamics in two athletes training locations (the campus stadium in the Oradea University and the Valea Roşie Natura 2000 site).

The Valea Roşie Natura 2000 site is a complex specific habitat of forests with *Asperulo-Fagetum* type, of which forests occupy 86%, followed by land occupied by forests in transition (5%), pastures (5%), grape vine (2%) orchards (2%). In this area, with a surface of 819 ha there are 14 species protected of rare plants found on the red list, species of amphibians and reptiles of national importance (Herman et al., 2016).

Material and methods

The present research was conducted between 31st of May 2016 –9th of June 2016 on the players of a female volleyball team of Oradea's University Sport Club, aged between 18 and 24, the team playing in the senior level of the A 2 West Division. In order to obtain relevant and objective results, during the study period three training workouts were conducted, with an average duration of 60 minutes,

identical in content and type of effort. Blood samples were collected in the mornings after performing the effort and have been subjected to analysis and interpretation.

Training sessions (Szabo-Alexi, 2009, Szabo-Alexi et al., 2016) were held for three consecutive days in the period 31st of May 2016 – 2nd of June 2016, on the sports campus of the University of Oradea (fig.1,3) (located in Oradea city, in the Crisurilor Plain, Bihor County, on the left side of Crişul Repede River, at about 110 m altitude); there was a break of 10 days following a new series of training during 12th of June–14th of 2016, in the Valea Roşie Nature 2000 site (Türk et al., 2004, Baltaretu, 2012) (located in Oradea`s Hills (fig.1), at altitudes around 150 m, a protected natural area situated on the territory of Bihor County, in north-western Romania, coupled with the collection of blood samples in the mornings after performing the effort.

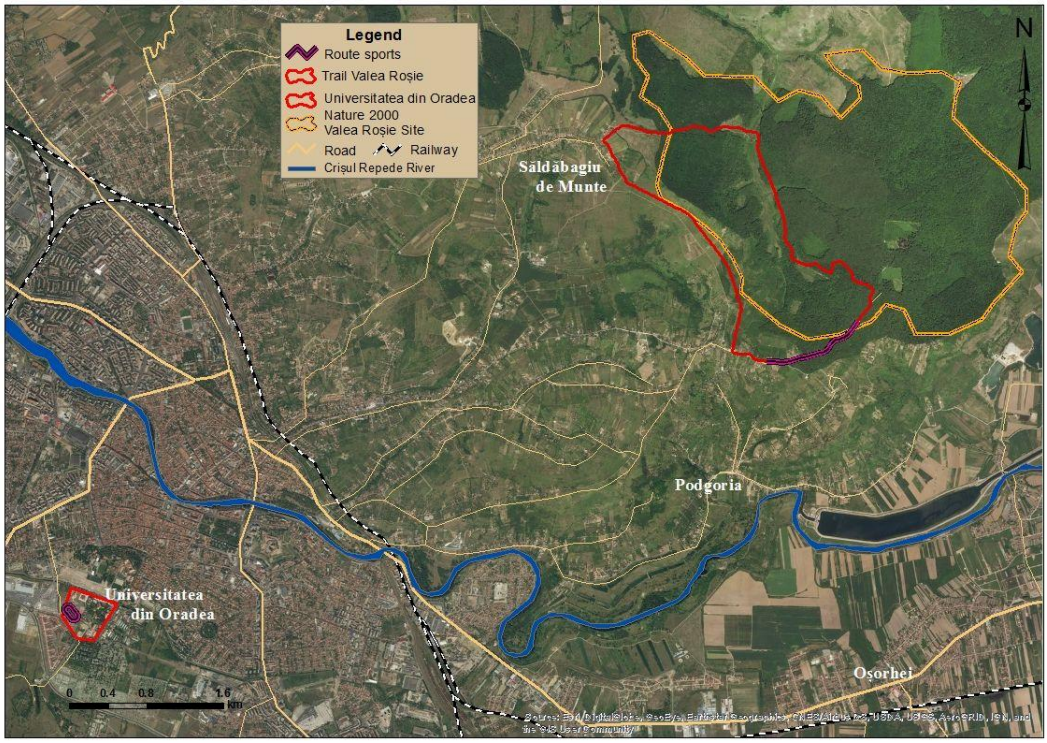

Figure 1. The sports fields location within the campus of University of Oradea and Valea Rosie Nature 2000 Site, Bihor County, Romania

The exercises of each player have been tracked using a Polar RC3 heart rate monitor, a model that incorporates GPS tracking[1]. The following indices were monitored: distance travelled in each exercise, duration, calories consumed, heart rate, minimum and maximum altitude. After the effort, biological samples were taken, analysing the following indices: Creatine kinase (CK), Lactate dehydrogenase (LDH) and Sideremia. The data obtained were downloaded using the Polar software and the data analysis and interpretation functions were used). The dedicated web application was used, and the medical analyses were performed on the Beckman

Coulter AU680 analyser, Beckman Coulter reagents were used according to IFCC standardized methods. The laboratory is RENAR (Romanian Accreditation Association) accredited according to ISO15189: 2013[2].

Figure 2. Running surface within Valea Rosie Nature 2000 site.

Figure 3. Running surface on sport camp, the Campus University of Oradea site.

Results

The statistical analysis reveals that there is no significant difference in the parameters of the effort carried out at the campus stadium of the University of Oradea and in the Valea Roşie Nature 2000 site respectively; but from the point of view of the biological samples, two of the three parameters (Creatine kinase and Lactate dehydrogenase) expose significant changes after the Valea Roşie Nature 2000 training. Thus, the Independent t Test indicates a value of 2.44 in the statistical analysis of Creatine kinase (table 1), 1.90 for Lactat dehydrogenase (table 2) and 1.72 for Sideremia (table 3). Comparing these values with the one-dimensional critical values we can see that if the first two measurements can reject the null hypothesis for the Sideremia biological parameter, we cannot reject this hypothesis, which is also reinforced by the one-dimensional critical probability where the value displayed for Creatine kinase and Lacate dehydrogenase is lower than all α usual values.

Table 1. Test t of statistics for Creatine kinase

t-Test: PairedTwoSample for Means		
	Variable 1	Variable 2
Mean	159,75	234,0833333
Variance	4022,568182	8236,992424
Observations	12	12
Pearson Correlation	0,099848821	
Hypothesized MeanDifference	0	
df	11	
t Stat	-2,442958094	
P(T<=t) one-tail	0,016325508	
t Criticalone-tail	1,795884819	
P(T<=t) two-tail	0,032651016	
t Criticaltwo-tail	2,20098516	

Table 2. Test t for Lactate dehydrogenase

t-Test: PairedTwoSample for Means		
	Variable 1	Variable 2
Mean	104,4166667	145,3333333
Variance	1818,44697	1852,424242
Observations	12	12
PearsonCorrelation	-0,513433268	
HypothesizedMeanDifference	0	
df	11	
t Stat	-1,901637848	
P(T<=t) one-tail	0,041859013	
t Criticalone-tail	1,795884819	
P(T<=t) two-tail	0,083718026	
t Criticaltwo-tail	2,20098516	

Table 3. Test t for Sideremia

t-Test: PairedTwoSample for Means		
	Variable 1	Variable 2
Mean	90,66666667	120,5
Variance	914,2424242	2443,181818
Observations	12	12
PearsonCorrelation	-0,079805454	
HypothesizedMeanDifference	0	
df	11	
t Stat	-1,723393267	
P(T<=t) one-tail	0,056385992	
t Criticalone-tail	1,795884819	
P(T<=t) two-tail	0,112771984	
t Criticaltwo-tail	2,20098516	

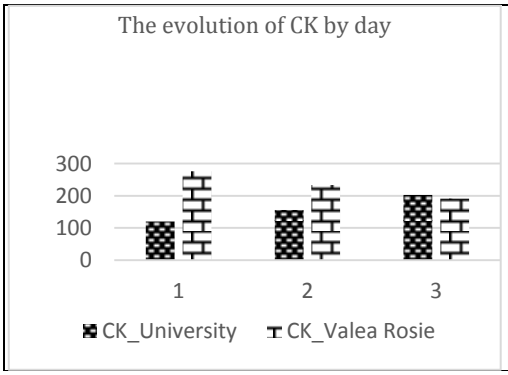

Figure 4. The dinamics of *Creatine kinase evolution*

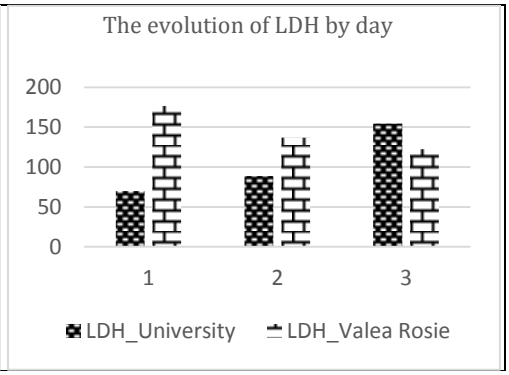

Figure 5. The dinamics of *Lacatadehydrogenase evolution*

Analyzing the data for CK and LDH, a correlation can be made between the results and the purpose of the study (basically the values obtained from the effort carried out on the stadium on the campus of the University of Oradea are increasing

for days 1,2,3 (fig.4) while the results of the effort carried out in the Valea Roşie Nature 2000 site are decreasing for days 8, 9, 10 (fig. 5).

Discussions

The above situation can be explained by the fact that the muscles are progressively stressed in the effort deployed at the campus of the University of Oradea, while the effort carried out within the Valea Roşie Nature 2000 site is easier to perform (probably also due to the superior oxygenation, psychic relaxation of the athletes, the softer surface on which the physical effort is performed (grounded land (fig. 3). In fact, on the stadium from the campus of the University of Oradea fatigue accumulates (LDH increases), the muscles are progressively stressed (CK increases), there is a period of insufficient break to eliminate the total CK released (muscles are still stressed). However, the muscular stress is easier to perform (CK decreases) and muscle fatigue decreases (LDH decreases) in the Natura 2000 site.

Conclusions

Organizing trainings in sites like Natura 2000 has a favourable influence on the biochemical parameters, but a lesserone on the physiological parameters, as they are conducted in a friendly environment. The link between environmental conditions in which athletes achieve their training and the dynamics of biochemical parameters can provide important data on how to act at certain stages of the training. Conducting training in different environmental conditions and "breaking" the routine can be a motivating factor in engaging athletes in their activity. It is partially confirmed that the physical effort made during training and, implicitly, the biochemical parameters may be influenced by environmental conditions and air quality. According to the results obtained, there are prerequisites for carrying out extensive research in this direction.

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Considerations regarding pedagogical practice of physical education students at gymnasium

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Abstract. European integration perspective determines major changes in the Romanian economy and society. Education has become, in the turn, the field that starts to know major changes imposed by the new European standards. Considering these statements, the present paper aims to identify issues related to how physical education students are perceived by the middle school pupils in professional practice. Our study is based on a questionnaire with 12 items, applied to secondary school pupils (105 students, 43 girls and 62 boys) from a unit of application activity to improve teaching practice.

Keywords: physical education students, pedagogical practice, gymnasium

Introduction

European integration perspective determines major changes in the economy and Romanian society. Education has become, at the turn, the field who has undergone major restructuring imposed by new European standards. In the spirit of contemporary education, the teacher is no longer just a source of learning, it is also the organizer, coordinator, evaluator of resources (staff, material and human) and conditions (social, psychological, pedagogical) necessary to achieve the objectives instructional and educational.

A particularly important aspect in the development of the activity of pedagogical practice of students is related to social competence. According

McKenzie, 2007, a teacher without adequate preparation, is very difficult to create physically educated youngsters. Social competence of the student practitioner can be identifying both with students and with the group of students during the course of directing teaching and learning, and in the way of relating to the manner in which colleges and receives suggestions, comments etc. (Carlson, 1995; Sas &Popa, 2004).

Approach the training and self-training of students has a complex character and aimed at both side of accumulation, analysis, processing, interpreting information and also relay the information (Raţă & Raţă, 2007).

A decisive aspect for the future of teacher, aimed specialized knowledge and skills, to which must be added pedagogical competence manifested in specific conditions formative activities or competitive. (Carreiro da Costa & Onofre, 2005; Tsangaridou, 2006; Cojocaru et al., 2015). An important aspect, highlighted by Hardman and Marshall, 2000, is the status of physical education and physical education teachers worldwide.

The problem concerns the initial training of teachers throughout European society at this level creating a veritable network of information on training teachers, known as Eurydice. Since 1999, the Bologna Declaration has established a unique system of training of university students focused on three levels: bachelor, master, doctorate (Blândul, 2008).

Pedagogical tact is, from a psychological perspective, the knowledge and understanding of psychological characteristics of students (Iurea, 2008). The mentor is a teacher from the school application that provides initial guidance and preparing students for a teaching career. He must provide relevant models, positive, correct relationship, honest, and competent in science for future teacher. The mentor is the key element that helps ensure teaching awareness to support developments in teaching practice by concrete work in schools (Pasca, 2008).

Classroom management can be defined as all educational practices used by the teacher in the classroom to establish and maintain favorable conditions for carrying out the educational process. An effective class management enables optimum use of time devoted to teaching and ensuring the proper implementation of teaching (Lungoci & Boc-Sînmărghiţan, 2008).

Starting from these considerations and based on our experience we supposed that the activity of the students in physical education classes is influenced by the presence of practitioners students.

In this way, we proposed through this research to evaluate the opinions of the students form secondary school about the physical education classes conducted by the practitioners students and the way is influenced by them.

Materials and methods

For getting useful data and having the premises of valuable results, we used questionnaire method, which was conducted by specialists in the field and which was composed of 10 questions, pretested before being applied for getting the research data. After applying questionnaires, we obtained information that we have analyzed by the statistical and mathematical point of view.

There were questioned 105 students (43 girls and 62 boys) from classes V-VIII of the Greek Catholic High School from Oradea which were practiced physical education classes with practitioners students.

Results

Physical education class is regarded as important by 48 students and very important by 57 students, that not a single considers unimportant the student physical education class. Regardless of the age/class, students consider physical education lesson as important and very important. Thus: Class V to - 100% Class VI - 96.71%, Class VII and VIII -100% (fig.1).

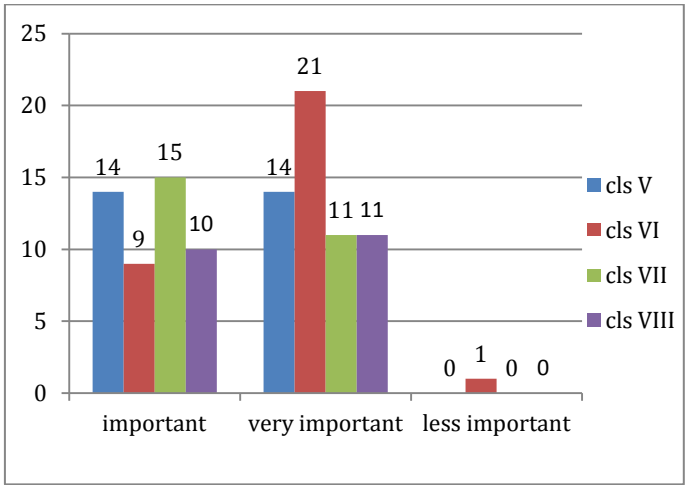

Figure 1. Chart comprising importance of physical education lesson for students

Students consider that practitioners students have good and very good training in physical education class, so 53 students (50.47%) believe they have a good preparation and 46.66% believe they have a very good preparation. Only 2.85% said students are less prepared. Such is seen preparing students to each class: Class V and VII believes in 100% of the students are good and highly trained Class VI - 93,54% and class VIII -95% say they are well prepared and very well (fig. 2).

How students manage to convey information verbally and practice pupils it is essential in the teaching approach. Thus, students consider the 91% that students explain and demonstrate appropriate lesson content, only 8.57% believe that they are not properly explained and demonstrated the lesson. Class V consider students to explain and demonstrate deemed appropriate lesson content, class VI at a rate of 90.32% Class VII - 96.15% and Class VIII - 97% (fig. 3).

Student-pupil relationship, 17.14% considers tolerant, 2.85% consider exigency, 4.76% consider rigid/uncomprehending, but 75.23% believe that the relationship as opened/understanding. The relationship student- pupil is perceived by pupils of V was as open/tolerant in 60%, 64% class VI, 82% in class VII and 95% in class VIII.

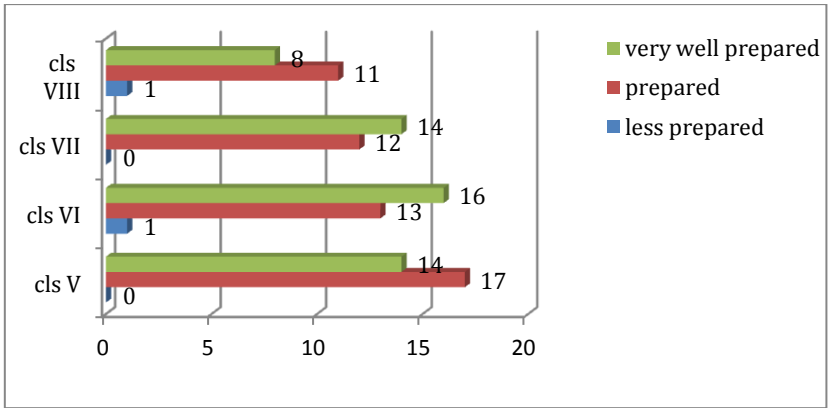

Figure 2. Chart including the opinion of students regarding the training of the practitioners

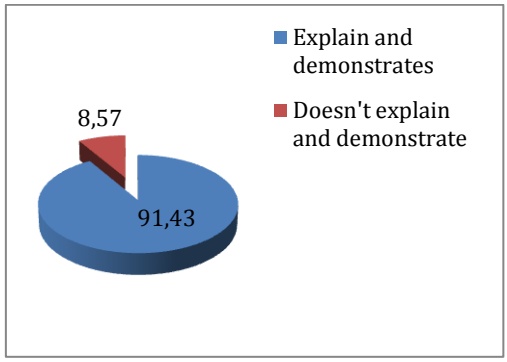

Figure 3. Chart opinion of the students regarding explanations and demonstrations of the practitioners students

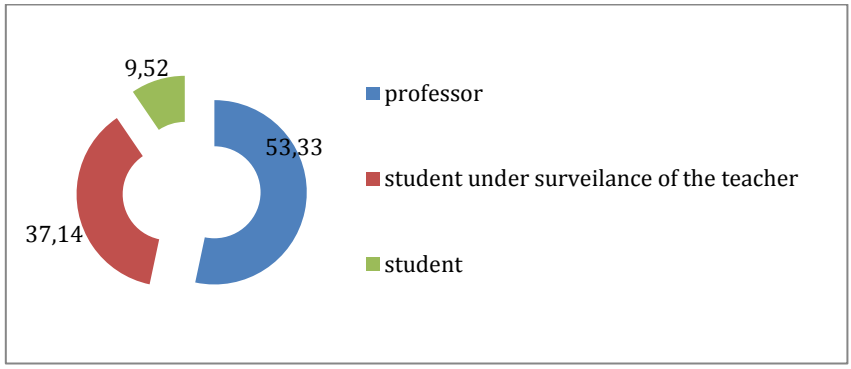

Figure 4. Chart students about driving preferences including physical education classes

Student preferences are divided between the lessons with the attending professor - 53.33% in the presence of students and professors - 37.14% and 9.52% with only one student. Noteworthy is the students' opinion about the preferences conduct physical education classes with students or professors practitioners. Thus, students of classes VI and VI prefer classes conducted with professors and students

of classes VII and VIII conducted with students prefer classes, but with the professor holder (fig. 4).

Students are very interesting findings regarding the attitude of students in the classes. Here are some of them: understanding, friendly, open, serious, trained, respectful, demanding but also bring new games, explains very well.

Discussions

Lesson management is one of the major concerns of teachers at the beginning of their careers. Even before engaging itself, students future teachers, as a result of experience from teaching practice, are questioning how they will "restrain" students, how will impose their authority with the students, as they will listen (Chouinard, 2008). Managing tense situations ask the teacher a number of qualities such as the ability of discernment, the ability to see beyond appearances, intelligence, spontaneity, experience, diplomacy, etc., qualities that will be earned in time (Ţoca, 2002). Another very important aspect that should not be neglected at the discipline physical education is connected to the material resources, supplemented by ability, skill, interest of the teacher which determine the increases of attractiveness of the lesson (Cristea et al., 2013).

Conclusions

The importance of practicing physical exercise as physical education lesson is underlined by more than 90% of pupils in classes V-VIII Greek Catholic High School. Students practitioners are trained and highly trained in the concept of middle school students. Accompanying explanations and demonstrations students teaching approaches and are appreciated by students, thus preparing students in this direction is essential. Pupils enjoy the company of students which shows a favorable approach to sport. Impact on teaching practice in secondary school students is positive.

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