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# PERSONALITY TRAINER CHARACTERISTICS AS JOB SATISFACTION PREDICTORS

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## SUMMARY

The main aim of this research was to define the calculated personality five big characteristics model for the total job satisfaction. The Big Five Inventory (BFI, John, Donahue and Kentle, 1991), as well as the 9 aspects of job satisfaction, which were measured on the Job Satisfaction Survey scale (JSS, Spector, 1985). Except the personality characteristics, as the predictor type, the trainer variables of gender and work experience were researched. The examinees sample consisted of 126 football, basketball, volleyball and handball trainers in permanent employment on the territory of Belgrade. According to the achieved results of the multivariate covariance analysis and hierarchy multiple regression analysis the conclusion, that for the relevant prediction of trainer job satisfaction distinguish the trainers who have high scores on the pleasant and neuroticism scales, was made. For the satisfactory prediction in some aspects of trainer job the three personality trainer pleasantness, conscientiousness and neuroticism characteristics are separated from the whole. The categorical trainer variables (gender and working experience) - as predictors - didn't show statistically significant.

**Key words:** sport trainers, Big Five model, trainer job satisfaction.

## INTRODUCTION

Personality is good predictor of those behaviors, which are impossible to predict using the general mental abilities, knowledge, adroitness and concrete situations (Barrick & Mount, 2005; Ones, Viswesvaran & Dilchert, 2005). Individual's behavior is determined by his personality characteristics and situational factors, which are changeable during the time. In order to exchange and predict job satisfaction, knowledge about individual's personality characteristics and his surroundings is required. For that latent dimensions excite growing interest of researches.

McCrae & Costa (1991) have made a model called personality Big Five model, which assumes existence of five following basic personality dimensions: (I) extraversion, (II) neu-

roticism, (III) pleasantness, (IV) conscientiousness and (V) openness to experience. Main virtue of this model is strong empirical foundation and conceptual wideness. So "Big Five" becomes one of the leading models in personality psychology during the XX century. In this work, authors started from the fact that the afore-mentioned theory has attracted great researchers' attention in the recent decade. There is a great deal of literary agreement about "Big Five" model application convenience in the researches, which are related to the work surrounding. Only some hitherto studies from the mentioned domain will be brought here.

According to Wrightov's (2006) research, the term job satisfaction shows social attitude, which involves cognitive and conative dimensions and feelings. Paul Spector (1997) has

empirically established theoretical base job satisfaction, defining it as "what personality feels towards his/her job and uncorresponding occurrence of job types. Job satisfaction is, to some extent, also an indicator of job stimulus of total job situation.

Development of "Big Five" model personality dimensions contributed to the researches and connection of personality characteristics with job satisfaction variables.

At the beginning of the XX century, Tailor & Gilbert began research of the job satisfaction phenomenon (Wright, 2006), supposing that the idea of scientific management largely reduces the body fatigue amount and contributes to the people's sole satisfaction, which is necessary to complete the job tasks. According to these authors' researches, it is inevitable that worker, being in accordance with the idea of scientific management in the shortest time interval, performs the tasks, for which he will be greatly financially awarded. Their initial thought was that if a worker adopts general principles of scientific management as his own, expanding minimum physical and psychological strength, he will achieve the best results and gain maximal monetary compensation. It will lead to his job satisfaction. Therefore, according to the scientific management theory, monetary compensation is relevant for improving the job satisfaction degree of individuals.

Individual behavior is determined by his personality characteristics and situational factors. Great number of authors has researched linear job satisfaction correlation and some personality dimensions. Some factors significance related to this phenomenon can change during the time. However, some researches indicate that personality dimensions have certain stabilizing role in the job satisfaction evaluation, so latent personality dimensions arouse greater researcher's interest.

Significant researches number checked the Big Five model validity on the different world wide populations. Validity of five big factors was verified to a great extent.

According to the Đurić-Jočić and collaborator's researches (2004), Big Five model, assumes that characteristics of a person can be quantified using the self-evaluation question-

nnaire and that they significantly contribute to opinion, emotions and human posture.

Judge, Heller & Mount's researches (2003), has drawn attention to some personality characteristics of Big Five model, which are statistically significant predictors of job satisfaction. Maximal correlation has been determined between neuroticism and job satisfaction ( $r=-.38$ ), which indicates that these people are prone to experiencing bad feelings. Also, according to the same authors' findings in the study, conscientiousness is the second dimension, which is in the significant positive mutual relation with the job satisfaction ( $r=.31$ ). It is expected that if the examinees achieve significant results on the conscientiousness variable, they will develop high-quality work characteristics, work appreciation and inner business success. There is a greater job satisfaction.

Furnam & Zacherl (1986), Watson & Slack (1993), Watson & Clark (1997) are, according to the Judge's research (1999), singled out the extraversion personality characteristic as significant predictor job satisfaction variable.

McCrae & Costa (1991) have defined pleasantness variable as significant job satisfaction predictor. People, who achieve significant results on this latent dimension, are stimulated for accomplishing significant level of emotional connection with their collaborators, and therefore for accomplishing greater extent of job satisfaction.

On the sample of 300 teachers and collaborators working at the Universities in Novi Sad and Belgrade, Matanović (2009) has researched predictive values of personality characteristics of Big Five model for the total job satisfaction as well as 9 job satisfaction aspects, which were measured by Job Satisfaction Survey scale. Apart from personality characteristics, as categorical predictors, gender and university work experience variables have also been examined. According to the achieved results, it is concluded that, as significant predictors of total job satisfaction, the pleasantness and neuroticism characteristics are distinguished, while categorical variables have not shown as significant predictors. For the prediction of some job aspects satisfaction the following issues are separated: pleasantness, conscientiousness and neuroticism, being: pleasantness

for aspects such as: improvement, management, job nature, communications and cooperatives; conscientiousness for aspects such as: cooperatives, benefits and rewarding and neuroticism for aspects such as: management, job nature, communications, cooperatives, benefits and rewarding.

The main aim of this research is to check predictive value of dimension personality variance (as predictor), gender and trainer work experience and some occurrence of trainer job types satisfaction (as criterion).

## METHOD

### *Sample and procedure*

The research has been conducted on the representative sample of 126 examinees ( $M=33.7$  years;  $SD=11.06$ ) in the following football, basketball, volleyball and handball clubs on the territory of Belgrade city: FC "Rad", YFC "Belgrade", BSC and FC "Cukaricki Stankom"- Jelen Super Serbian League; BC "FMP", BC "Mega vizura", VC "Belgrade" and BC "Superfund BP"- A basketball league - VC "Obilic", VC "Partizan" and VC "Crvena Zvezada" - I volleyball league; HC "Crvena Zvezda", HC "Kolubara" and HC "Partizan" - Super handball league.

The questionnaires have been given to the football, basketball, volleyball and handball trainers, who are permanently employed. They have been administrated to the examinees before the training, with the presence of the examiners. Before the examination, the examinees have been read and interpreted the questionnaire manual.

The examination was completely voluntary and anonymous and it was conducted in the September of 2010.

### *Instruments*

In this empirical research two measuring instruments have been applied: a) Job Satisfaction Survey (JSS, Spector, 1985) and b) The Big Five Inventory (BFI, John, Donahue & Kentle, 1991).

Each particle, actually the claim about 9 job satisfaction aspects has been evaluated by the

Job Satisfaction Survey questionnaire, which contains 36 items, with six-scale of Likert's type. Achieved results, from this scale, enable 10 independent calculations such as: 9 job satisfaction aspects (pay, advancement, management, benefits, rewarding, work procedures, cooperatives, job nature and communications), i.e. the achieved examinees results on the individual subscales, while 10. achieved result- general measure job satisfaction - presents the amount obtained by results addition of all test entries.

Using the Cronbach-alfa coefficient (Cronbach, Glaser, Nanda & Rajaratnam, 2004) it is determined that relatively high inner consistency of this 36-item Scale ( $\alpha>.89$ ), and the objectivity of some sub-scale values goes within ranges of .64 to .85.

The second applied measuring instrument, The Big Five Inventory, by which the personality dimensions are evaluated according to the "Big Five" Model, consisted of five-scale of Likert's type, which is separated into 44 claims with 5 following sub-scales: extraversion, pleasantness, conscientiousness, neuroticism, openness to experience. The examinees have the task to mark each continuous predictor, actually the five-factor personality model claim, using the number, which suits its personality characteristics self-description on the five-scale from 1 to 5 (1 - I do not agree at all, 5 - I totally agree). The total result is formed as linear evaluation combination.

44-item scale objectivity of Five big dimension personality model, is  $\alpha=.87$ , which is satisfying reliability measure of inter metric applied measuring instrument characteristics.

In this research, calculated coefficient of inner Cronbach  $\alpha$  consistency, for both applied measuring instruments, does not immensely differ from findings, which Matanovic achieved (2009).

Apart from the two mentioned measuring instruments, general data examinees' testing has been conducted by the help of two predictor categorical variables: gender and trainer work experience in a club. The second variable has 5 following ranges: 1–5, 6–10, 11–15, 16–20 and 21–30 years and more trainer experience.

Data processing has been based on the co-

variance analysis. For the quantitative and qualitative differences definition, actually significant predictors for some satisfaction trainer job aspects, the multifactor analysis covariance (MANCOVA) has firstly been applied, and then also the analysis variance (ANCOVA) for every of satisfaction trainer job aspects.

Statistic program MedCalc software (version 8.1.0.0 for Windows, MedCalc) has been used for data processing.

## RESULTS

In the Table 1 the univariate effect of predictor variables for total trainer job satisfaction is visualized.

Conducted analysis draws attention to the fact that according to the level of statistically F-test significance, i.e. the variance predictor variable relation of total trainer job satisfaction, separates the personality pleasantness and neuroticism dimensions.

TABLE 1.  
*AKOVA of continuous predictor variables on total trainer job satisfaction*

	SS	df	MS	F	p	$\beta$
Extraversion	57.24	1	56.36	.10	.95	.04
Pleasantness	5176.04	1	5937.02	11.46	.01	.29
Neuroticism	5108.66	1	5421,54	8.35	.02	-.25
Openess	148.29	1	149.22	.32	.75	.02
Conscientiousness	1382.27	1	1291.24	1.98	.15	-.09
Gender	348.27	1	397.23	.18	.63	.08
Sport experience	301.27	1	311.06	.49	.73	.05

Note: R=.46; R<sup>2</sup>=.21; F=1.94; p=.00

Legend: **R** - multiple correlation coefficient, **R<sup>2</sup>** - determination coefficient, **F** - Fisher's test for statistically significance determination, **P** - statistical significance level of multivariate test, **SS** - arithmetic mean, **df** - degrees of freedom, **MS** - middle square of corrected arithmetic mean, **p**- level of multivariate test statistic significance,  **$\beta$**  - beta standardize partial contribution.

TABLE 2.  
*Covariance predictor variable analysis*

	Wilks' Lambda	F	p
Extraversion – E	.923	1.438	.09
Pleasantness	.866	3.125	.01
Conscientiousness – C	.885	2.164	.00
Neuroticism – N	.953	1.956	.05
Openess to experience – O	.956	1.429	.12
Gender	.937	1.562	.07
Sport experience – SS	.926	.657	.65

Legend: **Wilks'  $\lambda$**  - Wilk's lambda test, **F** - Fisher's test for statistically significance determination, **p** - level of statistical significance.

In order to gain the knowledge, if some personality characteristics and categorical variables, gender and trainer work experience in a club contribute to the differences of 9 job satisfaction aspects, the multifactor covariance analysis (MANCOVA) has been applied.

Covariance analysis results on the level of individual variables (Table 2) show that three personality dimensions: pleasantness ( $F=1.438$ ,  $p<.01$ ), conscientiousness ( $F=2.164$ ,  $p<.00$ ) and neuroticism ( $F=1.956$ ,  $p<.05$ ) are separated from the five factor personality

model whole, and in that manner present statistically significant continuous predictor of so-me trainer job satisfaction aspects, along with the error less than 5% (Table 3). Further analysis of F-test - relation variability value in

the system of categorical predictor variables (gen-der and trainer work experience in a club) – has not shown statistically significant differences between arithmetic means.

TABLE 3.  
*MANCOVA - model significance*

	R	R <sup>2</sup>	R <sub>c</sub> <sup>2</sup>	df	MS	F	p
Pay	.53	.26	.11	33	42.14	2.09	<b>.02</b>
Advancement	.48	.29	.09	31	25.16		<b>.00</b>
Management	.54	.24	.13	32	34.34	2.17	<b>.03</b>
Benefits	.39	.17	.12	34	28.46	2.11	<b>.01</b>
Work procedures	.41	.19	.07	35	.05	1.59	.26
Cooperatives	.52	.18	.12	33	25.01	1.97	<b>.05</b>
Job nature	.63	.29	.22	35	28.14	4.01	<b>.00</b>
Communication	.39	.20	.11	35	19.88	2.03	<b>.00</b>
Rewarding	.38	.23	.09	35	28.26	1.47	<b>.03</b>

Legend: **R**- multiple correlation coefficient, **R<sup>2</sup>** - determination coefficient, **R<sub>c</sub><sup>2</sup>** - corrected determination coefficient, **df** - degrees of freedom, **MS** - middle square, **F** - Fisher's test for statistically significance determination, **p** - level of statistical significance.

TABLE 4.  
*Predictor variables significance for some trainer job satisfaction prediction*

	E	P	N	S	O	SEX	RS
Anvancement	E	4.11					
	P	.06					
	$\beta$	.12					
Management	E	9.24	4.97				
	P	,01	.00				
	$\beta$	.32	-.21				
Benefits	E		9.03	4.73			
	P		.05	.02			
	$\beta$		-.12	-.19			
Rewarding	E			10.67	5.97		
	P			.02	-.01		
	$\beta$			-.18	-.24		
Collaborators	E		30.14	5.16	5.87		
	P		.00	.05	.04		
	$\beta$		.41	-.17	-.21		
Job nature	E		22.35	4.15			
	P		.01	.04			
	$\beta$		.19	-.13			

Legend: **F** - Fisher's test for statistically significance determination, **p** - level of statistical multivariate test significance,  **$\beta$**  - beta standardize coefficient beta, **E** - extraversion, **P** - pleasantness, **N** - neuroticism, **O** - experience openness, **SEX** - gender, **RS** - trainer working experience.

Statistically significant predictor variables of some job satisfaction standpoints are illustrated in the table 4.

Reviewing the F-relation, statistically significance level and Beta coefficient, it is established that for the statistically significant prediction of job satisfaction standpoint, which is determined as advancement, the personality pleasantness dimension is an exception. Thereafter, two personality characteristics (pleasantness and neuroticism) have separated from the five factor personality model whole as significant predictor variables for the following four job satisfaction aspects: management, collaborators, job nature and communications.

Calculated Beta coefficient stresses that the examined trainers with the positive values on the pleasantness scale and negative results on the neuroticism scale lead to the higher level of trainer job satisfaction aspect – management.

Other than that, trainer job satisfaction aspects such as: collaborators, benefits and rewarding, can be predicted according to the personality characteristic - conscientiousness.

However, it can also be established, that the two predictor categorical variable variability (gender and trainer work experience in a club) are not statistically significant for the prediction of some trainer job satisfaction aspects. Furthermore, with the analyzed dimension personality “Five Big” model variance prediction of the pay and work procedure cannot be achieved, as trainer job satisfaction aspect can.

In this research, calculated significance F-test level is in accordance with the Matinić's results (2009).

## DISCUSSION

This work tends to define variability, i.e. quadratic value exception from the predictor total trainer job satisfaction variable arithmetic mean and its satisfaction aspects, according to the personality characteristics of “Big Five” model variables and two predictor categorical variables (gender and trainer work experience in a club).

The five factor model structure showed that the personality pleasantness dimension

and neuroticism are the significant predictor of total trainer job satisfaction variable, actually examinees who achieve higher results on the neuroticism scale reached higher trainer job satisfaction degree, while examinees with high neuroticism have lower trainer job satisfaction degree. Apart from that, trainers, who have high values on the pleasantness scale, develop friendly relationship with sportsmen and their collaborators. In reference to the fact that they are friendly with sportsmen, they will, taking everything into consideration, successfully find their place in the work surroundings, so we can be quite sure that they, in spite of the high trainer job satisfaction, would not have any obstacles in the communication with sportsmen and collaborators.

Regardless the fact that there are not any congruent researches on the trainer population, distinguished personality characteristics pleasantness presents significant trainer job satisfaction predictor, for high result on the pleasantness scale probably causes high inner or intrinsic motif for achievement and emotional trainer stability, intense intimacy with sports-men and collaborators, or grater trainer job satisfaction.

Contrary to them, it is assumed that trainers, who have high values on the neuroticism scale, are prone to negative feelings manifestation during the training process. They are quickly enraged, usually have disagreements with players and explosively oppose, which indicates to conflict behaviors, which differ from the social-educational system of rules during the training process. Thus, this trainer population is probably prone to trainer job dissatisfaction advancement. Within the scope of five factors model three personality dimensions (pleasantness, conscientiousness and neuroticism), have been manifested as significant predictors of some trainer job satisfaction aspects.

A personality characteristic, pleasantness, is significant predictor for advancement aspect, but also for management, job nature, and communication and collaborators aspect prediction. Trainers, who achieve high results on the pleasantness personality dimension, will lead satisfaction to a higher level by the help of mentioned occurrence trainer job satisfac-

tion types. Trainer, who is good-tempered and ready to collective work, is prone to balance in every way, in order not to enter into a conflict during the interpersonal relations. Therefore, the trainer, with the high results on the pleasantness scale, will most probably have high values from the point of job, and of advancement as well. Trainers, who achieve strikingly high results on the scale of pleasantness, adopt a system of rules independently from their understanding. Therefore, they will lead management satisfaction to a higher level - since they believe they should treat their sportsmen needs - adopt their system of rules, perfectly agree with them, without any analysis or evaluation, since they believe that most sportsmen are good. They, as pleasant persons, who seek harmony and interpersonal closeness, will achieve significant satisfaction level on this management aspect.

Neuroticism personality dimension is excepted as the most common predictor satisfaction variable of some trainer job standpoints. Trainers, who achieve significant results on this scale, will, in an organization sense, have lower satisfaction of trainer job occurrence types, which are marked as: management, job nature, communication, collaborators, benefits and rewarding. This entire means that they hardly achieve harmony in the existing circumstances, they are usually in a conflict with their sports-men, collaborators and their reputation. Furthermore, they need much more time to recover from a psychic experience, which over-burdens and exhausts organism, contrary to trainer who have low result values on this scale. They are very easily opposed, prone to great excitements and negative feelings in their life domains. So it is obvious that they will be on the lower trainer job satisfaction level, for they will, under the trainer process structure, express negative feelings.

According to the achieved results on the conscientiousness scale job aspects satisfaction can be predicted as: collaborators, benefits and rewarding. Trainers, who achieve significant results on this scale, will have lower satisfaction level of mentioned job types, since they are characterized by responsibility, persistence and motivation for achieving their goals. It is assumed that these trainers, for their inlay

enormous work, expect corresponding rewards. Apart from that, it can be sensed that trainer, who achieved significant result on the conscientiousness scale, is also mostly concentrated on an individual, and less on a collective training. Consequently, trainer of this kind manifests lower satisfaction level in occurrence satisfaction type - collaborators. It is most probable that he will see his collaborators as potential danger in achieving his goals in a sport club.

It is unusual that personality extraversion dimension has not manifested as statistically significant trainer job satisfaction predictor, although Judge and collaborators (1999, 2002) have excepted it from the personality characteristics of "Five Big" model whole as one of the most important predictor variables. Also, trainer job aspects (pay and work procedures) along with predictor categorical gender and trainer work experience in club variables, have not shown to be statistically significant, and so they could not been prognosticated by the help of researched predictors.

## CONCLUSION

According to the research findings, on the specific sample football, basketball, volleyball and handball trainers, who are permanently employed, variability prognostication, in predictor variables personality dimension "Five Big" model system and trainer job satisfaction criterion, is defined.

Achieved results of this research indicate to the fact that three personality five factor model dimensions (pleasantness, conscientiousness and neuroticism) statistically significant for the trainer job satisfaction and some of its aspects prognostication. In addition to this, results indicate to the conclusion that sport trainers, who achieve significant results on the neuroticism and conscientiousness scales, lead trainer job satisfaction and some of its aspects to a lower level, while trainers, who achieve significant results on the scale of pleasantness, lead trainer job satisfaction to a higher level.

Since the examinees sample is not sizeable, it could be interesting to examine the predictive validity of these applied continuous and

categorical variables on the representative sample of trainer population and other sports.

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# OSOBINE LIČNOSTI TRENERA KAO PREDIKTORI ZADOVOLJSTVA POSLOM

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Osnovni cilj ovog istraživanja je ispitati prediktivnu vrijednost dimenzija ličnosti, pol i radni staž trenera i zadovoljstva trenerskog posla (kao kriterijum).

Uzorak ispitanika činilo je 126 trenera ( $M=33,7$  godina;  $SD=11,06$ ) u stalnom radnom odnosu sa teritorije grada Beograda iz 14 sportskih klubova i to: FK „Rad“, OFK „Beograd“, BSK i FK „Čukarički Stankom“ – Jelen super liga Srbije; KK „FMP“, KK „Mega vizura“, OKK „Beograd“ i KK „Superfund BP“ – A – košarkaška liga; OK „Obilić“, OK „Partizan“ i OK „Crvena zvezda“ – Prva odbojkaška liga; RK „Crvena zvezda“, RK „Kolubara“ i RK „Partizan“ – Super rukometna liga.

U istraživanju su korišćeni slijedeći mijerni instrumenti: a) Skala Job Satisfaction Survey (JSS, Spector, 1985) i b) Skala The Big Five Inventory (BFI, John, Donahue & Kentle, 1991), kao i dvije prediktorske varijable: pol i radni staž trenera u klubu. Metodom Cronbach-alfa koeficijenta (Cronbach, Glaser, Nanda and Rajaratnam, 2004) utvrđena je relativno visoka unutrašnja konzistentnost Skale Job Satisfaction Survey ( $\alpha>0,89$ ), kao i skale modela „Pet velikih“ dimenzija ličnosti ( $\alpha=0,87$ ), što predstavlja zadovoljavajuće mjere pouzdanosti internih metrijskih karakteristika za oba primjenjena mjerena instrumenta.

Definisanje značajnih prediktora za pojedine aspekte zadovoljstva trenerskim poslom urađeno je primjenom višefaktorske analize kovarijanse (MANCOVA), dok je za svaki od aspekata zadovoljstva trenerskim poslom primjenjena analiza varijanse (ANCOVA). Za obradu podataka, korišćen je statistički program MedCalc software (version 8.1.0.0 for Windows, MedCalc).

Rezultati F-testa pokazali su da samo dvije dimenzije ličnosti, prijatnost i neuroticizam, imaju univarijatno dejstvo na ukupno zado-

voljstvo trenerskim poslom. Rezultati analize kovarijanse naglašavaju da su tri dimenzije ličnosti: prijatnost, savjesnost i neuroticizam, statistički značajni prediktori pojedinih aspekata zadovoljstva trenerskim poslom. Na osnovu statističke značajnosti Beta koeficijenata konstatovano je da je dimenzija ličnosti prijatnost značajna za predikciju aspekta zadovoljstva posla napredovanje, dok su dvije osobine ličnosti (prijatnost i neuroticizam) značajni prediktori za aspekte zadovoljstva poslom kao što su: rukovođenje, saradnici, priroda posla i komunikacije. To ukazuje na činjenicu da će treneri sa pozitivnim vrijednostima na skali prijatnosti i negativnim rezultatima na skali neuroticizma dovesti na viši nivo navedene aspekte zadovoljstva trenerskim poslom. Takođe, osobina ličnosti savjesnost značajan je prediktor aspekata zadovoljstva trenerskim poslom kao što su: saradnici, beneficije i nagrađivanje. Osim toga, zaključeno je i to da prediktorske varijable pol i radni staž trenera u klubu, kao i aspekti trenerskog posla plate i radne procedure, nisu statistički značajni za predikciju. Zanimljivo je i to da se dimenzija ličnosti ekstraverzija nije ispoljila kao statistički značajan prediktor zadovoljstva trenerskim poslom, bez obzira na to što su Džadž i saradnici (Judge et al., 1999, 2002) utvrdili da je ona najbitnija prediktorska varijabla.

U ovom istraživanju, dobijeni rezultati u sistemu prediktorskih varijabli dimenzija ličnosti modela „Pet velikih“ i kriterijuma zadovoljstva trenerskim poslom u skladu su sa nalazima Matanovićeve (2009).

Dobijeni rezultati interpretirani su u kontekstu dosadašnjih saznanja o osobinama ličnosti, polu i radnog staža, i zadovoljstva trenerskog posla. Provjerom najznačajnijih teorijskih pristupa postavljena je osnova za nadogradnju novih saznanja o karakteristikama ovog složenog fenomena u trenerskoj (fudbalskoj, košar-

kaškoj, odbojkaškoj i rukometnoj populaciji. Ovim istraživanjem dat je doprinos psihologiji sporta kao naučnoj disciplini, odnosno cijelovitom razumevanju predviđanja dimenzija ličnosti i zadovoljstva nekim pojavnim oblicima trenerskog posla, a samim tim i plodonosnije implikacije na sportsku praksu. Dobijeni rezul-

tati predstavljaju referentnu tačku šireg longitudinalnog istraživanja trenerske populacije i u drugim sportovima u kojem će dobijene nalaze biti moguće sagledati u kontekstu predviđanja aspekata zadovoljstva trenerskim poslom na osnovu osobina ličnosti modela „Pet velikih“.

**Ključne riječi:** sportski treneri, Big Five model, zadovoljstvo trenerskim poslom.

# BASKETBALL IN THE TERRITORY OF FORMER YUGOSLAVIA IN 1941

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## SUMMARY

Development of basketball in the territory we are talking about, during the WW II, remained quite un-researched, so the subject and the goal of this paper is to research, analyze, highlight and obtain from oblivion that same period. We hope to stir up the sports historians, and also other readers interested in history of sports for further research.

During writing usual historical method was used (finding of primary historical sources, their critics, as also the finding and studying of the secondary historical sources). A numerous sources made in that time were reviewed and consulted (magazines, newspapers, papers, records, reports, overwrites, etc.) in: archives, libraries, institutes, private archives and museums of sports of former Yugoslavia, as also the sources made afterward.

During 1941 basketball took place in Belgrade, Novi Sad, Split, Šibenik, Dubrovnik and Kotor. The competitions were played occasionally but most intensively in Belgrade. Serbian Basketball Federation was founded in September, also in Belgrade.

**Key words:** basketball, competitions, II War World.

## INTRODUCTION

In the territory of former Yugoslavia basketball starts to play first among Sokol youth, and then in Sokol societies. In elementary school Studenci, near Maribor, it starts in 1919th. It was introduced by Ćiril Hočevar, the teacher of that school, who met basketball even before 1914 by working in schools in Maribor, where basketball was played among school youth.

In Belgrade it starts in the beginning of October 1923 after the visit of Mister William A. Wailland, deputy of the Red Cross. He came to Belgrade because of the organization of children's games and playgrounds. Course about children games, for male and female teachers of primary schools, teachers of gymnastics, Sokol and Scout leaders, was held from 27 September to 18 October of that year,

at the playgrounds of elementary school Savamala and the Cathedral Church. Among other games, the course participants were shown the new American game - basketball. Upon completion of the course, male students of Second Belgrade High School started to play it. After Belgrade, with the same goal Wailland went to: Sarajevo, Novi Sad, Bitola, Skopje, Niš, Zagreb, Split, and Ljubljana, where he also presented a new game. Soon basketball begins to play in those, and other places: Bitola 1924, Novi Sad, 1924, Niš 1925, Mostar, 1926, Tuzla, 1927, Zadar 1928, Zagreb 1929, Štip 1932, Karlovac 1933, Boka Kotorska 1935, Sušak 1938, Split 1939, Petrovgrad 1939, Sarajevo 1939, Ljubljana 1939, Dubrovnik 1940, and so on.

Period from 1929 to 1940 is extremely important for the development of basketball in the region of the former Yugoslavia. Basket-

ball begins to play, not only among Sokol and school youth, but also among students. Many matches were played among existing teams. They begin to play the first international club and representative games.

Student representation of the Kingdom of Yugoslavia played its first international game with the representation of Italy B, on March 20<sup>th</sup> 1938 in Rome. On the 5<sup>th</sup> of July of the same year, on the 10th Allsokol reunion in Praga, they played international game with representation of the Czechoslovakia.

Sokol union of the Kingdom of Yugoslavia (SSKJ), as a representative of Yugoslavia was accepted to International Basketball Federation (FIBA) in middle of December 1936.

First championship of SSKJ in basketball was held on 28 and 29 September 1940 in Borovo, where participated 180 basketball players, male and female, divided in 15 teams from seven Sokol districts.

We could think that in the time of Second World War people did not pay much attention to sports activities. But, that was not really the case. Research showed that people in those hard times did pay attention, among other things, to various sport activities, and also to basketball. Even if it was greatly played already, a long time people were silent and wrote very little about it.

Development of basketball in the territory we are talking about, during the WW II, remained quite un-researched, so the subject and the goal of this paper is to research, analyze, highlight and obtain from oblivion that same period. We hope to stir up the sports historians, and also other readers interested in history of sports for further research.

## METHOD

During writing usual historical method was used (finding of primary historical sources, their critics, as also the finding and studying of the secondary historical sources). A numerous sources made in that time were reviewed and consulted (magazines, newspapers, papers, records, reports, overwrites, etc.) in: archives, libraries, institutes, private archives and museums of sports of former Yugoslavia, as also the sources made afterward.

## RESULTS AND DISCUSSION

### *Basketball activities from January until the 6<sup>th</sup> of April 1941*

In organization of Headquarters of SSKJ from 2 to 6 January 1941 in Sokol house of Sokol society Beograd-Matica, in Delgradska Street no. 27 was held federal course for basketball. The host of the course was Marjan Maržan, and all accepted candidates had to apply on January 2<sup>nd</sup> until 14.30h. The ones being late will not be accepted, better said will not be able to attend the course.

All said about the course is clearly said in the Annunciation – the letter of the Headquarters of the SSKJ no. 12943/40, addressed to sister Sofija Mladenović, member of Sokol society Beograd-Matica.

„With this we inform you that you have been accepted to the federal course for BASKETBALL which will be held from 2 to 6 January 1941 in the Home of Sokol society Beograd-Matica (Deligradska 27). On the 2 January 1941 you have to report yourself to the host of the course, brother Marjan Maržan until 14.30h. You will get the course agenda after you apply. Those being late and un-regular will not be accepted, better said will be removed from the course.“ (see the picture of the letter)

In the cause of basketball popularization, in the magazine “Yugoslav sport and Air forces”, no. 2, from 7 January 1941, published in Belgrade, in page 38, Maržan published the article entitled “Basketball match in Belgrade” in which he described the game played in Belgrade in the late 1940 among teams of School for physical education (ŠTV) from Belgrade, and Sokol society Beograd-Matica. He played in the Beograd-Matica Sokol society, and scored six points.

In Belgrade on 19 January 1941, in the hall of Sokol house Soko Beograd I, were played three games. Six teams competed: three from Sokol society Beograd-Matica (members, generations of boys and girls), two teams of students (man and woman of ŠTV from Belgrade) and the team of Sokol society Soko I from Belgrade.

In his diary, Miodrag Stefanović writes:

"Last week were held three basketball games in Belgrade, in Sokohall Beograd I. Three generations of Soko society Beograd-Matica attended in matches with students (M,W) of ŠTV, and also the generations of Soko I." (Maržan, 1941, 6)

#### PICTURE 1

*Invitation letter to Sofija Pekić to attend the national basketball course in 1940*



First game was played between the generation of SS Beograd-Matica and the students of ŠTV. Students won with the result 7-6 (6-6). For Matica team played: Ružica Radovanović (scored all 6 points), Draga Đurović, Kosara Petraček, Mira Pavliček and Sofija Mladenović, and for students: Vacac, Rižnar, Matejić, Poljaković, Jevtić, Lešnik and Ferster. For students scored: Vacac (3) and Poljaković (4). The referee was Miodrag Stefanović.

„Before the beginning of the game the chief of the Soko I, brother Selimir Radovanović saluted the guests pointing the hard work of SS Beograd-Matica and his coordinator for games because of the progress of basketball in Belgrade. In the second half-time, after tight fight, in which the dominant was the play of sister Ružica Radanović, the game ended with 7-6. Students won, but this time un-deserved, because the generation of Matica was, if not even better, than a fair opponent.” (Ibid)

Second game was played by the members of Matica and students of ŠTV, with presence of huge number of spectators. The game end-

ed with the winning of Matica 23-22. The referee was Selimir Radovanović. For Matica played: Maržan, Travica, Debelja, Trčković, Nikolić, Stojković, Mišeljić and Stefanović, and for students: Šuput, Lašman, Kokot, Cizej, Tominić, Vlahović, Dančević and Kobali. For Matica scored: Maržan (3), Debelja (2), Stojković (10), Mišeljić (4) and Stefanović (4), and for students: Šuput (2), Lašman (4), Kokot (4), Tominić (2), Vlahović (4) and Kobali (6). With Maržan, among other, stands:

“...but now starts the tough game forced by students. The game ends with the deserved minimum win of Matica scored by Maržan from free-through 23-22. The game was refereed very good by the brother Selimir Radovanović. Only, he let the very hard play, which can have much worse consequences on a slippery ground.” (Ibid) Miodrag Stefanović wrote about that game in his diary on Sunday 19<sup>th</sup> January 1941:

“Than comes our member from ŠTV. Our first five Travica, Nikolić, Vasa, Mišeljić, myself, started peaceful and calm game. Vasa leaves the game, and Maja enters. Butcher game of ŠTV continues. Than Maja was fouled so hard that Sele had to assign penal. Penal has to determine who is going to win... and finally goal... and end... We won. Than I saw that generation players were no gentleman because they were saying that their team is not complete, even thou it was. Even Kobali and Ratko played together. Result was 23 to 22 for us” (according to Paunić, 1981, 298)

In the third, last game, meet generation of Matica with the team of Soko I. Soko deserved to win with the result 14-8 (12-6). The referee was Marjan Maržan, who refereed “very strict and did not let the game to gain the unpermitted hardness” (Maržan, 1941, 6)

For Matica played: Oliča, Enci, Petković, Tomić, Mladenović, Vujičić, Senić, Denić, Ostojić and Aksentijević, and for the Soko I: Nenadović, Mikulić, Lermer, Jotić, Popović, Tomin and Milošević. For Matica scored: Enci (2), Petković (1) and Denić (5), and for the Sokols: Nenadović (10), Mikulić (2) and Milošević (2).

These games, the same as the ones before them, were used for further popularization of

basketball in Belgrade.

Maržan writes:

“We can be proud that Sokols propagate that game, and go far ahead from all the rests who think that they are more forward than us. The work of the SS Beograd-Matica should be especially commended because they managed to play with three groups, and with very good resultas.” (Ibid)

It was planned that on Sunday, 26 of January of the same year play three games between: SS Petrovgrad and SS Beograd-Matica, SS Zemun-Matica and SS Beograd I, and between generation of Beograd-Matica and SASK.

„The game will start on the 26<sup>th</sup> this month; in the morning, at 11 o'clock, and the price of the entrance is minimal, because the games have the propaganda character.” (Ibid)

Maržan predicts that the games will be nice and interesting for the spectators, and most of all because of the presence of the basketball players from Petrovgrad, whom he considers as great players.

„As the brothers from Petrovgrad are very good players, and they have participated at the federal games of basketball in Belgrade, the meeting will be satisfyingly interesting and beautiful, and the rest of the program also promises nice games.” (Ibid)

It is unknown to us if the planed games were held.

According to diary of Miodrag Stefanović the last game in period between two wars (1918-1941), and right before the very attack of Hitler on Yugoslavia, was played in Belgrade on Sunday 16<sup>th</sup> March 1941 between the teams of SS Zagreb II and SS Matica-Beograd. Zagreb team won with the result 59-32 (29-14).

In the diary, Sunday, 16 March 1941, Stefanović writes:

“...we lost with 59-32 (29-14) even thou we were fully equal. I achieved only six goals, because Zlatko was watching me so good... that I could not move at all.” (according to Paunić, 2007, 166)

After staying of Marjan Maržan in Belgrade where he was mostly working on spreading of basketball, on 3 February 1941 he leaves Belgrade, from December of 1939, and goes to

Ivanec. Gala sendoff was made in his honor by his friends – basketball players and all his admirers. Stefanović in his diary from Monday, 3 February 1941 writes about how they have escorted Maja in the railway station:

#### PICTURE 2

*Marjan Maržan*



“The last day that Maja is with us... and in the afternoon when I went to the station a whole group of friends was already there, with Maja in the middle. He was very excited. He's getting all sorts of gifts. The moment of our separation is closing, and I have noticed from all present faces that they were excited. One man from our neighborhood we all loved and will always remember. Maja enters the train... than we could hear from everyone goodbye – goodbye – goodbye and the train quickly left the station.” (according to Paunić, 1981, 298)

Right with the arrival to Ivanec, which is somewhere around Varaždin on 18 February 1941, he addresses the letter to Miodrag Stefanović in Belgrade, in which, among other things, writes:

“That is my biggest whish, and it would be a great joy to me that during my arrival to Belgrade to academy of Soko II from Zagreb I see that everything is in order...and don't let them disappear from basketball people. You should all work on that, to gather as many of you as you can, to get new members and also not lose the old ones, and that will be a real success. I

would like to see gathered old basketball society renewed with some new "stars"." (according to Paunić, 1981, 318)

In the rest of the letter he writes:

"Wish Paja success in his work. But now he does not have to trouble so much, because that main thing, the beginning and the foundation I've already made. Did you get your own baskets, or you practice at the school ones? You have to force your own baskets in the big hall, and due to the suggested games, you should do something also." (according to Paunić, 1981, 301)

Writing among them continues. From the same place on 3 March he sends the letter to Miodrag Stefanović again, in which, among other, says:

"Keep the games as you predicted, because there is no progress without games. You have a lot of players in use so you can combine a team: Travica, Mišeljić, Nikolić, Debelja, Vlahović, Šuput, etc. they could play really good with us, and I think they would not be weak. Did you played with Petrovgrad already? How the new players develop? Did you trained starts regularly, and how the old "aces" get along? ... because the players have contributed a lot to Matica this year, and not only in the sense of competition, but in all other areas, starting from the work in the Sokohall and so on." (Ibid)

He is probably talking about the game which is going to happen on 16 March 1941 in Belgrade between the teams of SS Zagreb II and SS Matica-Beograd.

Maržan continues with writing with his friends players. On the 3 of June 1941 he addresses the letter to R. Radovanović in Belgrade, in which, besides other things, says:

„I hear that some work could be done on summer playground in Kalemegdan. Gather yourself, brothers Stanko and Zvonko Neferović will try with Rafa to do something there, especially to play volleyball and basketball... so I send regards to all known basketballers, people from Matica and all others known and unknown, and especially You with a lot of memories and brotherly Goodbye! Majo.” (Ibid)

### ***Basketball activities from 6th April until the end of 1941***

Historical development of basketball in the territory of former Yugoslavia until the end of 1941, and especially after the war, from 1945 forwards, is relatively good processed and highlighted, but the period during the WW II remained quite un-researched, so it would be useful and necessary to research and highlight that period too and rip it out of the oblivion.

Unfortunately, as Pavlović says:

“People here treat historical part of physical culture with a lot of negligence, better said historical sciences have been passive towards this area of human culture for quite some time, what brought a significant lack of methods and attention towards keeping and studying of those materials. From those reasons a very small number of primary historical documents were saved as same as other archive materials about physical culture during the War. That is also one of the reasons why in historiography literature, besides relatively rich memoir materials and popular affairs, we can rarely find scientific papers talking about the areas of physical culture.” (Pavlović, 1989, 3)

The same thing is with basketball, where also we can rarely find scientific papers about development of basketball in the time of WW II in the territory of former Yugoslavia.

Meaning and the role of sports, and with that also the meaning and the role of basketball, with us and in the world today is such that it cannot pass the attention of science, and by that out of the historical science, that is why bigger and bigger attention is on research of history of sports, and also the history of basketball during the War.

We could think that, in those war times, all troubles and hardness of war, in the territory of ex-Yugoslavia, people did not pay any attention to sports activities.

But that was not really the case. According to Pavlović:

„The happening, however, showed that the people, even in those circumstances, in spite of all difficulties and war troubles, found the strength and motives to, in small breaks, turn to themselves, their human culture identity. In that desire they did not

forget sports contests nor other forms of physical culture. What's more, these activities were very often the only way of distraction, only chance to express and maintain cultural traditions and continuum of living at all." (Pavlović, 1989, 387)

About the basketball during the WW II, even though it was greatly played already, a long time people were silent and wrote very little about it. About that Nebojša Popović says:

„Aca and me met in 1942, when our basketball in occupied Belgrade "certainly" played. It was not clear to me too why everyone is silent about it... Belgrade was occupied, as the rest of the Serbia, but especially during the 1942 basketball was played. There were seven or eight teams, Aco played for Obilić, together with Milorad Sokolović, Ratko Kašanin, who later did his PhD in international law and also was the president of Basketball Federation of Serbia." (according to Stojković, 2000, 17)

In the time of the occupation of Belgrade basketball was played with almost the same intensity as before the War. It was played by not only the before-war players, but also all other athletes and school youth.

Basketball, as Stanislav Paunić says:

"in those so controversial and paradox circumstances of this sub-period still finds the way and possibilities not only to keep it self, but also to rise up comparing to the period before (Maržans 170 from all Yugoslavia in 1940 vs. 300 players and 23 clubs - just from Serbia, for example), and somewhere (Prizren, for example) to appear for the first time! For this, probably even in European measures unique presenting of it, is especially indicative the case of mentioned "appropriate sample", - Belgrade, better said Serbia." (Paunić, 2007, 187)

As the work of Sokol was forbidden by the occupant authority, the athletes who used to practice in Sokol societies transfer to other sports clubs. In clubs, among other things, forms basketball sections. One of the first ones is SK Jugoslavija (later SK 1913) that formed basketball section for man and woman which had a significant influence on basketball

development in Belgrade. There were few sport clubs back then: SK Jugoslavija, BASK, BSK, BTK, Obilić, BOB, SASK, club of Vladan Mitić famous Belgrade trader, and others, which cherished basketball in new-formed basketball sections (clubs). Besides playing in clubs, they have played matches between themselves, organized the Championship of Belgrade in basketball (1941, 1942, and 1943) and worked on the popularization of basketball with Belgrade youth.

### PICTURE 3

*The game between two women teams (SK 1913 and BOB) during the occupation of Belgrade on Tašmajdan courts.*



All above mentioned clubs had remarkable players, so the games between them were always interesting and amusing. They played most of all on Tašmajdan playground (playground of BTK) and in Kalemeđan (playground of BOB).

About sports in Belgrade during those war days, journal "Kolo" states:

„First consequences of big changes in our sport appeared right after the War. It is noticed that the development of certain sports fields, which used to develop silently, without involvement of wider masses and no support, but thanks to a great sacrifice of certain individuals". (Anon, 1942, ?)

Mirko (Bata) Aksentijević<sup>1</sup>, participant of those happening, says about that:

„I have to say that there was a certain set of circumstances... we sort of... those players

<sup>1</sup> Gave the interview to Stanislav Paunić on 7 April 1980, recorded on tape

who have played in Matica... we were in SK 13 ..... that was a pre-war Yugoslavia.. after Yugoslavia failed... the name of the club failed, so... they did not want to go back to the old name... but the number 13 as the number of the founding year of the club... that was the name they took and we were in SK 13... and we founded one male, female club... better said it was more than for just one team... there were around twenty young boys and girls who played basketball... there were... other clubs too... some BASK, than BTK, Obilić, Mitić... Vladan Mitić. Famous Belgrade trader... his son played basketball... he had his own team too... etc." (according to Paunić, 2007, 174-175)

President of the SK 1913 was Joca Ružić, coaches: Nebojša Popović, Mirko Aksentijević and Zvonimir Neferović, and beside them in the club were also Miodrag Stefanović, Aleksandar Petrović, Ivan Dimić and Vasa Stojković.

Soon after that is formed the section for basketball. The management of the section was elected. Miodrag Stefanović was the secretary, Zvonimir Neferović the technical officer, Ljubiša Galović<sup>2</sup> the economist, board members of the club, Mirko Aksentijević and Veljko Ronac.

About those happenings leaves the inscription for the "Novo vreme" from 12 December 1941.

"As a first club in Belgrade it started to raise this sport SK 1913 which at the same time raises all sports. Starting to notice the value of basketball the management of SK 1913 decided to form and to cherish this game which is accepted by the youth so fast. On the founding meeting ... for the secretary Stefanović Miodrag, for technical officer Neferović Zvonko, for economist Ljub. Galović, board members are M. Aksentijević, V. Ronac". (Anon, 1941, ?)

That sports club (S.K. 1913) had a significant influence on the basketball development, not only in Belgrade, but in whole Serbia.

"This club not just in Belgrade, but in whole Serbia, started the actions for

spreading the basketball. When the S. K. 1913 founded its basketball section, he leaned on whit all his strengths to work on the more and more interest of the athletes for this sport. Hard work of the board of the basketball section did not leave without" (Anon, 1942, ?)

About basketball section of the SK 1913 in the „Novo vreme“, from 25 March 1942 was published the text with the following:

"Before the War the basketball in our territory was in "dippers". Today, when we need to entirely reorganize our sports, we need to take care about this type of sport too. To a few young and workable people, which stood up to launch this sport among our athletes, should be helped. S.K. 1913, with founding basketball section, accepted friendly these people and helped them in their wanting to popularize more this sport among athletes and its fans. Ever since the last championship of Belgrade in basketball (1941 a.t.a), which was successful in every aspect, these young people worked on organization of the today's most beautiful sport. The whole set of players was made that way, which is preparing itself to as soon as possible stands before the Belgrade audience and shows it the beauty of this game: speed, strength, fire, endurance, agility. Every roughness, bad intentions and hate is excluded." (Anon, 1942, ?)

Nebojša Popović says:

"I played for the S.K. 1913, the inheriting club of the famous SK Jugoslavija. In those War years, the name Yugoslavia, even in sports, was forbidden to mention, so the compromise solution was found. For us the 1913 was historically significant, because of the Second Balkan War. Vasa Stojković, also our college, future editor of the 'Večernje novosti' journal, played for BSK, later BTK - it's a Belgrade tennis club, were Bora Stanković also played, today's leading man in basketball, general secretary of FIBA..." (according to Stojković, 2005, 21-22)

In the S.K. 1913 basketball team besides Serbs played several Croats refugees. Popović says:

<sup>2</sup> Athlete, Serbian record holder in middle and long distance

"Those were the Yugoslav people. They escaped from the Independent Country of Croatia, and found their rescue in Belgrade. I remember Zvonko Neferović from Zagreb, Veljko Ronac from Šibenik, Vlade Mađeruh from Karlovac." (Ibid, 23)

#### PICTURE 4

*Lined teams of SK 1913 (black) and Izbjeglice (white) before the beginning of game on Tašmajdan*



Aleksandar Petrović<sup>3</sup>, also the actor of those happenings is saying:

"During the occupation we continued in the S.K. 1913... former Jugoslavija... and... the trainings there were pretty serious... there gathered everyone that used to play in Soko or in the House of the King Aleksandar... one of them was Nebojša Popović... than Mija Stefanović... than Vasa Stojković, Bata Aksentijević, Nebojša Dimić from the Man's Third... played very good... those were quite strong teams... there were also female teams... and we played among us... at the side court... and that was maybe... maybe for the young to gather... and the coach was Nebojša Popović, Bata Aksentijević and... Neferović... the president was Joca Ružić... and that he loved basketball very much... and on the other hand helped a lot... some very beautiful games were played... I know those were our nice days... in those hard times this was a sort of... refreshment." (according to Paunić, 2007, 177)

Svetislav Vulović<sup>4</sup> says that he renewed

basketball in Belgrade during the occupation. How it happened he says:

"I renewed basketball... during the occupation... there was the question of all young to go to the mine in Bor... then they came to me and said... if we would do something... that would have nothing to do with Germans, and they would not have any use from it... and they would like to play some sports... they could be saved from the mine... and with the personal lust I accepted that job... then it was played in the Belgrade tennis club... no tennis was played during the occupation... and I accepted to be their new pioneer... if you can call it that way... and from that generation are today's leaders and managers... Bora Stanković, Nebojša Popović, Šaper, Munčan... than Vasa Stojković, Mija Stefanović... and a lot of others... which continued... than it was played... sort of championships but the clubs were BTK, Jugoslavija, BSK, BASK... and it was played like that... for maybe two seasons." (according to Paunić, 2007, 177)

On other place he says that the idea came from Bora Jovanović:

"In the time of occupation no sports were played seriously except football. One day in the 1942 Bora Jovanović, future professor on DIF, came to me and says: Doctor Bato, I have a suggestion. It's a little bit dangerous. So the Germans would not force young people to go to the mines, or to die somewhere in the woods, there is a hope that they would be protected if they play some sport. But we will have to risk. You need to be the president of the basketball federation, and me, of the volleyball federation. And we set the basketball and volleyball playgrounds on my tennis courts, and form of the teams: SK 1913, BSK, BASK, Obilic, Mitic and BTK. There played a hundreds of young, and so were saved themselves from the mines." (according to Stojković, 2005, 21)

About when he saw the baskets for the first time, when he started to play basketball, which

<sup>3</sup> Gave the interview to S. Paunić 18 June 1979, recorded on tape

<sup>4</sup> Gave the interview to S. Paunić 5 June 1979, recorded on tape

encouraged him, in what club, who played with him and like, Nebojša Popović, in the interview given to Stanislav Paunić in the 1979, among other things, says:

“...I graduated in the 1940... I met basketball in '42... following the circumstances... in that time of occupation.... In my street, not far from me, lived Ivan Dimić... in the football club Jugoslavija which was called SK 13 back than... was a goal keeper... sometimes I went with him to trainings... thanks to Nevenka Šešlija I went to that basketball... when I came there... after woman was a man training... one player was missing... there were nine of them... called me... and I liked it a little bit... and the same Zvonko Neferović who was living in Belgrade during the War in... in exile... because he, as an exponed Soko member and Yugoslav-oriented Croat escaped the terror of ustaše in Belgrade, and there he, with few of his friends with the same orientation as Vlado Mađeruh... Veljko Ronac... he was also there working around basketball... leaded the SK 13 back then... was a coach and a player... and after that practice he said to me... why wouldn't you play... it was a little bit flattering to me... and I promised him I will come... 42... 43 was already stopped... one decent basketball was played... but it had it's viewers than... in Belgrade was 6-7 clubs... back then... there was that SK 13, BSK, BASK, BTK, there was BOB, Mitić... SASK... there, seven I remembered now... Obilić was... there was one league.” (according to Paunić, 2007, 176)

Nevenka Šešlija<sup>5</sup> also remember those days: “Then came the War... which disturbed all of us... but still we had a pleasure to gather in some club again... to do some sports... and so prolonged that basketball “doing”... there was a lot of refugees who knew a lot about basketball... as Zvonko Neferović... and it is shore that we had a bit better basketball than the one from the beginning, so later... all of us... transferred to the clubs in new Yugoslavia... founded the

basketball section of Red Star... Mirjana Janačković was in the Zagreb team... and later came to our refugee team... in 913... she was a refugee.” (according to Paunić, 2007, 176)

### **Belgrade**

Refugees (athletes) which, during those war days, came from all parts of the former Yugoslavia, gave a significant contribution to a development of sports, and not only in Belgrade, but in whole Serbia in that War period. According to Miloš Hamović:

“In a mass of refugees who came to Serbia from all parts of the occupied Yugoslavia was a significant number of athletes. They were provided to do any sports they played back home, but with the condition that they are successful sportsmen so the domain clubs would pay attention to them. Same as that, the chance to continue their activities in this new environment got also the coaches and referees<sup>6</sup> of all different kind of sports, and sport-workers too.” (Hamović, 1994, 224)

Athletes (refugees) who were welcome as an improvement to all sports, and most of all Belgrade clubs: football (Stanković, Đajić, Manola, Radojičić, etc.), athlete (dr Narančić, dr Manojlović, Stepišnik, Lukač, Kovačević, Ćurčić, etc.), basketball, volleyball and other, according to the mentioned author, Belgrade press gave them a lot of space:

“...besides that they did not save compliments about their qualities. In numerous articles their contribution to progress of sports in Serbia was pointed out with the possibilities for their involvement to be of great success in the international competition. Besides football it was pointed out that the athletics could gain a significant improvement, because among refugees were pre-war state champions and record holders, as for example, Rade Ćuričić from Zagreb.” (Ibid, 226)

<sup>5</sup> Gave the interview to S. Paunić on 15 April 1980, recorded on tape

<sup>6</sup> In May of 1942 in Belgrade, besides the referee sports organization, a fond for helping the poor football refugee referees and the Serbians who were in hostile was founded (Obnova, 8 May 1942)

Refugees (athletes) in many sports (basketball, football, volleyball, athletics) had their teams, which have often had a competition with the representation of Belgrade and participated in many other competitions (tournaments) in Belgrade.

A significant influence on basketball development, among other factors, had refugees (basketball players) from different parts of Yugoslavia, especially from Croatia (Zvonimir Neferović, Veljko Ronac, Marjan Maržan, Vlado Mađeruh, Mileta Tešin, Nevenka Šešlija, Mirjana Janačković and others). Not only they played basketball in different Belgrade clubs, but they participated in the First basketball championship in Belgrade during the WW II with their team „Izbeglice“.

First basketball championship of Belgrade, in the time of War, was held on 27 and 28 September 1941.

Before the competition in the journal „Novo vreme“ from 24 September 1941, besides the competition propositions was also addressed the call to basketball referees from other parts of Yugoslavia who are going to be in Belgrade during those days, to register to the supreme referee Zvonimir Neferović.

“Applied teams can compete only if they are uniformly dressed. Every team is obligated to have their own ball. Besides the invited referees we kindly ask all other basketball referees from other parts of the former Yugoslavia, and who are now in Belgrade, to register to the supreme referee, Mr. Neferović at latest one hour before the start of the competition.” (Anon, 1941, ?)

„Novo vreme“ journal, from 26 September 1941 informs the readers, especially fans of basketball, that on Saturday and Sunday of that month, for the first time during the War, will be held the competition in basketball for the championship of Belgrade. They specially mention that one team of refugees-basketball players will compete and that the team „Matica“ under the lead of coach Marjan Maržan is very well prepared, so they could show the viewers that they have deserved to be the unofficial champs of the Serbia for the last year.

“Fans of this interesting game will have the chance for the first time after the War to see the competition in basketball. We

especially mention that one team of refugees who are now in Belgrade and do some serious training will also take part in the competition. Players of the “Matica” team who are very well prepared by their coach Mr. Marjan Maržan will play again to show and convince the audience that they really deserved to be called the unofficial champs of Serbia. Besides them two female teams will also take part and they will show that basketball is not only for man, but for the women too.” (Nenadović, 1941, ?)

Championship is organized by the basketball section of the SK „Jugoslavija“ (later SK 1913). Five teams took part in the competition: Matica, Omladinac, Izbeglice, SASK (High school amateur sports club) and Jugoslavija. Supreme referee was Zvonimir Neferović. The best team was Matica and they have deserved to win the first place.

In „Novo vreme“ from 29 September 1941 about that competition is written the following:

“On Saturday and Sunday was held the championship of Belgrade in basketball. The best and most shore team was “Matica”, who deserved to win the first place. The basketball championship was organized by the young section of the SK “Jugoslavija”. Fans of this beautiful and interesting game came in large number and cheered for their teams. These teams participated: Matica, Izbeglice, Omladinac, SASK and Jugoslavija.” (Nenadović, 1941, ?)

In revised documents we did not find, for now, more details about that championship. It stays unknown if the two, and which, female teams took part in the competition, as the „Novo vreme“ announced in the number from 26 September 1941. It also stays unknown who did, besides Zvonimir Neferović, referee the games, how many of them were played, who played with whom, the scores, as also other details regarding the championship.

After the end journal „Novo vreme“ from 4 October 1941 recorded one interesting detail about how the players of SK Matica and SK Jugoslavija agreed to come to the playground of SK Jugoslavija so they could sign to the newly formed basketball section of SK Jugo-

slavija. The players came as agreed. But they couldn't sign in. The reason why we quote in the following text:

"After the state basketball championship in Belgrade, the players of SK "Matica" and the players of the SK "Jugoslavija" came, as agreed, to the playground to sign for this newly formed section of SK "Jugoslavija". But, on the greatest surprise of all future players of SK "Jugoslavija" they were told: "Gentleman, you cannot sign with us." The reason - the ball is missing." (Anon, 1941, ?)

In the „Novo vreme“ from 27 October 1941 a text titled „On Sunday resolves the question of trophy owner for basketball and volleyball“ was published, and in the same journal, from 29 September 1941 a text under the title „Matica won the Belgrade basketball championship“.

On those bases we can state that besides the Belgrade championship, some other basketball competition for some other trophy was going on.

On that Sunday, in the month of October 1941, the match between female teams of BOB and SK 1913 was played. The BOB won with the result 12-9 (5-6). The referee was Mileta Tešin.

For BOB team played: Vojvodić, Radovanović, Janačković I, Janačković II, Komnenović, Petrović and Mladenović, and for the SK 1913: Aksentijević, Uzelac I, Uzelac II, Uzelac III, Gavrilović and Šešlja. For SK 1913 scored: Gavrilović (6) and Šešlja (3), and for the BOB: both Radanović and Petrović 4, Janačković II (2) and Komnenović (2).

In the „Novo vreme“ writes:

"Referee M. Tešin, good. Defeat again. Ladies of the SK 1913 two defeats in two weeks." (Anon, 1941, ?)

What means that the female team of SK 1913 played one game the week before which they have also lost, but it stays unknown with who they played, the result, roosters as other details too.

Maybe it's those two teams that „Novo vreme“ announced in the number from 26 November 1941.

"Besides these ones, two female teams will also take part and they will show that

basketball is not only for man, but for the girls too." (Nenadović, 1941, ?)

### ***Forming of the Serbian basketball federation***

„Novo vreme“ on the 31 August 1941 published the news that after the First Belgrade championship in volleyball, which will be held in the first week of the same year, will start with the forming of the Federation for basketball and volleyball. It is not mentioned if it is the Federation of Belgrade or Serbia.

PICTURE 5  
*Svetislav Vulović*



"During the next week the first Belgrade championship in volleyball will be held among clubs and societies that cherish this game. After this championship will be started the founding of Federation for volleyball and basketball." (Novo vreme, 30. august 1941)

In the first part of September 1941 the Serbian basketball and volleyball federation was formed. Svetislav Vulović was elected for the first president. Technical officer was Bora Jovanović.

Besides spreading the basketball, not only in Belgrade, but in whole Serbia, Federation also organized competitions, formed new clubs and sections, worked on their own rules, basketball rules, and on the improvement and organization of the referee staff.

Besides Belgrade basketball was played in other places (Novi Sad, Petrovgrad, Subotica, Šabac, Kragujevac, Niš, Prizren, Split, Zadar,

Dubrovnik, Šibenik, Kotor) in the territory of former Yugoslavia, with different intensity.

In some places, besides playing basketball, occupation army formed clubs, introduced it to schools, propagated and spread it among youth and other population, first of all because of the political and ideological influence, and all in cause of the denationalization of occupied population, for example in Novi Sad, Petrovgrad and Subotica it was done by the Hungarians, and in Prizren, Split, Zadar and Kotor by the Italian occupant authority.

### **Novi Sad**

Pavlović writes that:

“During the occupation there was no organized basketball section. The exception is the high school competition in Novi Sad as a part of the championship of the so-called South Hungary.” (Pavlović, 1977, 52)

Janik Ferenc, in his conversation with Stanislav Paunić on the 30 August 1978 in Novi Sad, says:

“School for teachers Novi Sad... in the time of Hungarians... we learned basketball... Steva Putnik came from Zrenjanin to Novi Sad, to work on basketball here in Novi Sad.” (Paunić, 2007, 186 i 251)

More detailed description of basketball activities in Novi Sad during the War gave A. Miklović in his paper „Evolution of basketball in Novi Sad“. He writes that after the occupation of Novi Sad by the Hungarian army, and after the arrival of teachers and all sort of other officers from Budapest, Segedin and other places of Hungary, basketball started in schools. The biggest credit for the introduction of basketball in schools goes to the teachers of physical education who started with the founding of basketball sections in schools they worked in.

“In very short time in high schools in Novi Sad the youth practiced basketball “alphabet” with the great excitement. In the same year the UAC (ujvidéki atletikai club) club from Novi Sad contracts its first basketball coach Lehel Tibor from Segedin, who will work as a Boarder Officer and a coach of teams in Novi Sad until the end of the War. By the conversation with the

former player of this club (Bozo Oskar), we find out that Lehel was a great expert and a pedagogist, and that it’s his contribution that basketball in Novi Sad in a very short time gain a lot of sympathizers and the level of teams from Segedin and other towns of South Hungary. Pupils were trained by their teachers of physical culture (gymnastics). In the Teacher’s and technical high school the teacher was Lucak (Luczák), and in Hungary Gymnasium was Kalmancai Zoltan, and in Traiding academy and in Gymnasium with Serbian language Moldovani Istvan (Moldovanyi Istvan). They trained in halls in their schools and in that time Partizan hall I (then Levente othon). The playground was marked with chalk or calx and a stands for high jump were used to attach the hoop.” (Miklović, 1972, 11-12)

In the school year 1941/42 the interschool championship of the city was held. Six teams competed: Teacher’s school, Hungary and Serbian Gymnasium, Trading academy, Agriculture and technical high school. The team of the Technical high school (IKY) won the first place, by beating all other teams. At the end they played the match with the representation of Novi Sad high schools, which they, also, defeated with the score 32-24. In the IKY team played: Janković, Taboroši, Segedinčev, Banko, Dević, Kiš and Gerdov.

### **Split**

Duro Vujanić in the letter from 23 March 1979 addressed to Stanislav Paunić, writes:

“During the occupation people from Zadar transfer the basketball to Šibenik and Split. In Split basketball caches deep roots and thanks to the Carbonini and Stefanini brothers (after the War, these last two played for “Reyr” from Venice) it manages to surpass ban.” (Paunić, 2007, 185)

Toni Petrić says:

“But we have to admit that the basketball in Split was “born” during the Italian occupation of Split in the WW II in the rope of fascist youth organizations.” (Petrić, 2000a, ?)

In the time of Italian occupation (1941-

1943) basketball plays in Split. The Italian soldiers and Italian youth from Split played it. The youth had two organizations „GIL“ (Gioventu Italiana di Littorio) and „GUF“ (Gruppo Universitario Fascista) in which was played basketball. They played some games from time to time. The Italians tried to gather in those organizations as many young people from Split as they could, most of all pupils from the elementary schools, so they could have the bigger ideological influence they possibly can, but they did not have such a great success in that.

“After taking over the Italians were in a hurry to start with the process of denationalization of our people, better said quick Italianization and fascization of all people attached to Italians. The main ways of terrorization were the general measures of Italianization with the emphases on fascization of young, better said signing in to GIL (Gioventu Italiana di Littorio). They went to the first and second grades of highschool, today's fifth and sixth grade of elementary school. The children and the parents were enteminated, parents were threatened to lose their jobs if their children don't sign in that organization. The emphasis was on the younger generations, because they have experienced a total failure with the pupils of the higher grades.“ (Petrić, 2000b, ?)

Duško Marović writes that after arrival to Split occupation soldiers:

“Occupied all sports societies, gave them new, Italian names, so they have also occupied the summer playground of Soko society Split from which they took our first baskets and transferred them to the courts of the former Academic Tennis Club (ATK) around Firul were they played the first basketball game.“ (Marović, 1982, 329)

During the 1941 „GIL“ and „GUF“ played several games in Split and Zadar.

On the 26<sup>th</sup> July of the same year was played probably the first game on Firula between GIL and GUF teams. The GUF team won 49-25. The referee was the lefthenet of the Italian Army Mazzini. In the GIL team played: Dante Stipizza, Bruno Candutti, Vincenzino Carbonini, Bartolomeo Veloce, Giovanni

Paolicevich, Eugenio Romanich, Vittorio Volich and Patrizio Lunazzi, and in the GUF team: Romano Foretich, Corrado Minussi, Guerino Senizza, Luciano Cuccoch, Matteo Romich, Severio Fiorentini one and Severio Fiorentini two.

Italian daily journal „San Marco“ that came out in Split, in number from 28 July 1941 wrote about that game.

#### PICTURE 6

*Picture from the newspaper about basketball game played in Split in November 1941*



Split, novembre 1941 - Incontro fra le squadre di Spalato e Zara. Con la maglia "Zara" da sin.: Abelardo Pittoni, Boris Vuchich semisentore, Sergio Fantoni, Aldo Bortolazzi, Antonio Zerauschek; in basso Agostino Zanne, Antonio Caravani, Calebotta ed a destra Mario Lastre.

By the end of November 1941 one more game between the „GIL-Spalato“ and „GIL-Zara“ was played, Marović writes that the Italian journal „Il Popolo di Spalato“ in number from 2 December of the current year brought the annunciation about the played game. For Zadar played: Abelardo Pittoni, Boris Vuchich, Sergio Fantoni, Aldo Bortolazzi, Antonio Zerauschek, Agostino Zanne, Antonio Caravani, Calebotta and Mario Lastre.

According to Petrić women also played basketball and participated in competitions organized in Split and other places. The students of Split high schools also played basketball and games between themselves. During the 1941, as Petrić writes, was played:

“...more games in Split and outside of the city in male and female competition and two games between the students of the Classic and Men's real Gymnasium.” (Petrić, 2000a, ?)

#### Dubrovnik

About playing basketball in Dubrovnik in the time of the WW II we only found noted the memory of Vlaho Kojaković.

He was a student of the School for physical education with his people from Dubrovnik: Vinko Cvjetković, Luka Ciganović, Pero Matan and Marija Kolarić, and people from Split: Natko Lahman and Uroš Tominić. There he met basketball. After bombing of Belgrade on 6 April 1941 he returns to his Dubrovnik. On the same year he started to work as a professor of physical education in Dubrovnik gymnasium.

Kojaković remembers:

"I started to work in Gymnasium, and that basketball was always on my mind. I also knew that I will be ridiculous to a lot of people if I start to teach boys and girls how to play basketball in a city of swimming and water-polo. But, I started, no matter what happens. And right at the beginning I started with a very pleasant surprise: in Dubrovnik existed one wooden basket made by a professor Ivo Kresić! I started to teach a group of young man to basketball "alphabet" on that basket. We played with that football ball, the basket was made from wood, hoop improvised... after two-three months I was surprised because around ten boys always wanted to play basketball. But in Dubrovnik it started to play more organized after the end of the WW II in 1945. The wooden basket of Ivo Kresić was still alive." (Bibić, 2003, 12)

### *Šibenik*

About basketball in Šibenik only one data was available to us, left by Đuro Vujanić in a letter from 23 March 1979, addressed to Stjepan Paunić, in which, among other things, he writes:

"During the occupation people from Zadar transfer the basketball to Šibenik and Split." (Paunić, 2007, 185)

It is quite believable that basketball occasionally played among youth.

### *Kotor*

In the time of War basketball starts in Kotor in 1941, right after the occupation of Boka Kotorska by the Italian army. The most credits for spreading of basketball goes to professor of Italian language, Italian Srđa Paronucija.

Close to Kotor Italian government founded a sports camp, with all a lot of sports device and equipment and among them were also the baskets. Paronucija formed a basketball team from Italian soldiers with whom he practiced. And not only had he learned the Italian soldiers how to play basketball, but he did the same thing with Kotor youth. They played matches occasionally. Several matches were played but did not get recorded.

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# KO[ARKA NA PROSTORIMA BIV[E JUGOSLAVIJE TOKOM 1941. GODINE

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Razvoj košarke na prostorima o kojima je riječ, za vrijeme II svjetskog rata, ostao je do danas nedovoljno istražen, pa nam je predmet i cilj ovoga rada da taj period razvoja košarke istražimo, proanaliziramo, rasvjetlimo njegov razvoj i otregnemo od zaborava.

Prilikom pisanja rada korišćena je uobičajena istorijska metoda (pronalaženje primarnih istorijskih izvora, njihova kritika, kao i pronalaženje i proučavanje sekundarnih istorijskih izvora). Pregledani su i konsultovani brojni izvori koji su nastali u to vrijeme (časopisi, novine, listovi, zapisnici, izvještaji, prepiske i dr.) u: arhivima, bibliotekama, institutima, privatnim arhivima i muzejima sporta bivše Jugoslavije kao i izvori koji su nastajali poslije toga perioda.

U organizaciji Načelništva Saveza Sokola Kraljevine Jugoslavije je u Beogradu, od 2. do 6. januara 1941. godine u Domu sokolskog društva Beograd – Matica, u Deligradskoj br. 27 održan savezni tečaj za košarku. Voditelj tečaja je bio Marjan Maržan i svi primljeni kandidati morali su se prijaviti, 2. januara do 14.30 časova, Maržanu.

U Beogradu su 19. januara 1941. godine, u dvorani Sokolskog doma Soko Beograd I, odigrane tri košarkaške utakmice. Takmičilo se šest ekipa: tri ekipe Sokolskog društva Matica Beograd (članovi, naraštajci i naraštajke), dvije ekipe studenata (muškarci i žene Škole telesnog vaspitanja iz Beograda) i ekipa Sokolskog društva Soko I iz Beograda. Prva utakmica je odigrana između naraštajki sokolskog društva Matica – Beograd i studentica Škole telesnog vaspitanja. Pobijedile su studentice rezultatom 7-6 (6-6). Drugu utakmicu su odigrali članovi Matice i studenti ŠTV, uz prisustvo velikog broja gledalaca. Utakmica se završila pobjom Matice rezultatom 23-22. U trećoj, posljednoj utakmici, sastali su se naraštajci

Matrice sa ekipom Sokola I. Sokoli su zaslужeno pobijedili rezultatom 14-8 (12-6).

Može se pomisliti da s početkom ratnih dešavanja i sa svim teškoćama i ratnim nedostacima, na prostorima tadašnje Jugoslavije, ljudi nisu uopšte posvećivali pažnju sportskim aktivnostima. O košarci za vrijeme II svjetskog rata, iako se uveliko igrala, dugo vremena se čutilo i vrlo malo pisalo. No za vrijeme okupacije u Beogradu se igrala košarka gotovo sa istim intenzitetom kao i prije rata. Igrali su je ne samo predratni košarkaši, već i ostali sportisti i školska omladina.

Kako je rad Sokola bio zabranjen, od strane okupatorske vlasti, to sportisti koji su do tada vježbali u sokolskim društvima prelaze u druge sportske klubove, gdje nastavljaju vježbanje. U klubovima se, pored ostalih, formiraju i košarkaške sekcije. Među prvima je u SK Jugoslavija (kasnije SK 1913) formirana košarkaška sekcija i za muškarce i za žene koja je imala značajan uticaj na razvoj košarke u Beogradu. Postojalo je u to vrijeme više sportskih klubova: SK Jugoslavija, BASK, BSK, BTK, Obilić, BOB, SASK (Srenjoškolski amaterski sport klub), Klub Vladana Mitića, poznatog beogradskog trgovca i dr, u kojima se gajila košarka u novoformiranim košarkaškim sekcijama (ekipama). Pored igranja u klubovima oni su igrali i međusobne utakmice, organizovali prvenstvo Beograda u košarci (1941, 1942, 1943) i radili na popularizaciji košarke među beogradskom omladinom. Svi naprijed navedeni klubovi su imali odlične igrače, tako da su utakmice između njih bile uvek interesantne i zanimljive. Najviše se igralo na terenima na Tašmajdanu (igralište BTK) i na Kalemgendnau (igralište BOB-a).

Na razvoj košarke znatnog uticaja, pored ostalih faktora, imali su i izbjeglice (košarkaši) iz drugih dijelova Jugoslavije, naročito iz Hrvatske (Zvonimir Neferović, Veljko Ronac,

Marjan Maržan, Vlado Mađeruh, Miletta Tešin, Nevenka Šešlija, Mirjana Janačković i drugi). Ne samo da su igrali košarku u raznim beogradskim klubovima, već su i na Prvom košarkaškom prvenstvu u Beogradu, za vrijeme Drugog svjetskog rata, nastupali sa svojom ekipom „Izbeglice“.

Prvo košarkaško prvenstvo Beograda, za vrijeme rata, održano je 27. i 28. septembra 1941. godine.

Prvenstvo je organizovala košarkaška sekcija SK „Jugoslavije“ (kasnije SK 1913). Na takmičenju je učestvovalo pet ekipa: Matica, Omladinac, Izbeglice, Sask (Srenjoškolski amaterski sport klub) i Jugoslavija.

U prvoj polovini septembra 1941. godine osnovan je Srpski savez košarke i odbojke. Za prvog predsjednika izabran je Svetislav Vulović. Tehnički referent je bio Borivoje Jovanović. Savez je pored rada na širenju košarke ne samo u Beogradu, već i cijeloj Srbiji, organizovao takmičenja, osnivao nove klubove i sekciјe, radio i na izradi svojih pravila, pravila košarke i na poboljšanju i organizaciji sudijskog kadra.

Pored Beograda košarka se igrala i u drugim mjestima (Novi Sad, Petrovgrad, Subotica, Šabac, Kragujevac, Niš, Prizren, Split, Zadar, Dubrovnik, Šibenik, Kotor) na prostorima bivše Jugoslavije, sa različitim intenzitetom.

U školskoj 1941/42 godini održano je međuškolsko prvenstvo grada. Na takmičenju je učestvovalo šest ekipa: Učiteljske škole, Mađarske i Srpske gimnazije, Trgovačke akademije, Poljoprivredne i Srednje tehničke škole. Prvo mjesto je osvojila ekipa Srednje tehničke škole (IKY), pobedivši sve eklpe. Na kraju su odigrali utakmicu sa reprezenatcijom novosadskih škola koju su, takođe, pobijedili rezultatom 32-24.

Za vrijeme italijanske okupacije (1941-1943) košarka se igrala u Splitu. Igrali su je Italijanski vojnici i Italijanski omladinci iz Splita. Omladinci su imali svoje dvije organizacije „GIL“ (Gioventu Italiana di Littorio) i „GUf“ (Gruppo Universitario Fascista) u kojima se igrala košarka. Tokom 1941. godine „GIL“ i „GUf“ su odigrali nekoliko utakmica u Splitu i Zadru.

U Dubrovniku je postojao jedan drveni koš kojega je napravio profesor Ivo Krešić! Na tom košu grupa mladića počela je da uči košarkašku abecedu tokom 1941. godine pod rukovodstvom profesora dubrovačke gimnazije Vlaha Kojakovića.

Košarka se za vrijeme rata počela igrati u Kotoru 1941. godine, odmah po okupaciji Boke Kotorske od strane Italijanske vojske. Najzaslužniji za širenje košarke je bio profesor italijanskog jezika, Italijan Srđa Paronucija..

**Ključne riječi:** košarka, takmičenja, Drugi svjetski rat.

# EVALUATION OF HAMSTRING FLEXIBILITY BY USING TWO DIFFERENT MEASURING INSTRUMENTS

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## SUMMARY

The purpose of the present study was to investigate the effect of two different methods of measurement for hamstring flexibility. Forty male students athletes with mean age  $23.45 \pm 0.44$  years and forty non-athletes students with a mean age  $23.08 \pm 0.98$  years participated in this study. Hamstring flexibility was evaluated by two different methods of measurement: a) a Myrin goniometer and b) sit and reach test. Statistical analysis included the use of Independent Samples T-test while significance was set at  $p < 0.01$ . The results indicated that athletes students scored better than non-athletes students only when hip joint's mobility was measured with a Myrin goniometer. In conclusion the evaluation of joint's mobility should be done by using a method of measurement that would isolate the articulation of measurement from the interjection of other joints or muscular teams something that is achieved by the use of Myrin goniometer than the use of Sit and Reach test.

**Key words:** hamstrings, Myrin goniometer, sit and reach test.

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## INTRODUCTION

Sports performance is the result of the interplay of various mental and physical factors. One of the main factors to improve and maximize athletic performance is the development of physical abilities. The capabilities of fitness are strength, speed, endurance and flexibility (American College of Sports Medicine, 1995).

Flexibility has been defined in many ways. It is used the term joint mobility indicates the degree of bending the normal range or scope of a joint or series of joints (Moller & Oberg, 1984).

Several sit-and-reach tests (SRs) are commonly used in health-related and physical-fitness test batteries to evaluate the hamstring and lower back flexibility (Jackson & Baker,

1986; Hoeger et al, 1990; Hui and Yuen, 2000). Such field measures are only moderate indicators of hamstring extensibility. However, the SRs are frequently used to evaluate the hamstring muscle extensibility because the procedures are simple, easy to administer, require minimal skills training and are particularly useful in large scale extensibility evaluation in the field setting. The classical SR (Wells & Dillon, 1952) was originally selected as a part of the American Alliance for Health, Physical Education, Recreation & Dance (AAHPERD) health-related and physical-fitness protocol, and is often included in standard fitness tests (e.g., EUROFIT: personal fitness tests, President's Challenge) and health related fitness programs (Institute for Aerobic Research, 1988) and A.A.H.P.E.R.D. (AAHPERD, 1984).

During measuring joint's mobility, however, a joint should be used as instruments to limit interference with other muscle groups or joints in the final measurement result. According to Harris (1969), the joint must be isolated at the time of measurement. Myrin goniometer isolates the joint from the interference of other joints without affecting the final outcome of measuring the length of other muscle groups (Leighton, 1955). Unlike measurement with the Sit and Reach test may lead to different results, because in anatomy and motion analysis of the test, participating in the final outcome of the measurement back muscles, hamstrings and the triceps surae muscle complex (Kendall et al, 1971). Most research has not dealt with the issue of the effect of the measure instrument to the final result of the measurement of a joint mobility.

The purpose of the present study was to examine whether the use of two different instruments for the evaluation of knee joint's mobility may affect the final result of measurement between untrained and trained individuals.

## METHOD

### *Participants*

Forty student-athletes and forty students (non athletes) participated in this study. Student-athletes had an average age of  $23.45 \pm 0.44$  years, height  $1.89 \pm 0.69$ cm and weight  $84.56 \pm 12.43$ kg. The relevant anthropometric characteristic of students (non-athletes) was: age, years  $23.08 \pm 0.98$ , height  $1.86 \pm 0.97$ cm and weight  $91 \pm 13.46$ kg. Both student-athletes and students (non-athletes) do not have a musculoskeletal problem before the time of measurement.

### *Procedure*

Testing took place in the exercise room at a private gym. Before testing, all participants performed a three minute warm up and static stretch routine, emphasizing the lower body. Immediately after the stretching, the flexibility tests were performed in a counterbalanced design. All tests were assessed on the same day for each student. The participants were

allowed to rest for 20 minutes between tests. One physiotherapist was responsible for each test. All measures were performed on the same day, and all tests were conducted with the participants wearing their shoes. For the evaluation of knee joint's mobility have been used two different instruments: the Myrin goniometer (Leighton, 1955) and Sit and Reach test (Wells & Dillon, 1952). The measurement of hip flexion with knee straight with Myrin goniometer was tested in a medical bed. The initial and final position of each movement passively measured starting from the anatomical neutral point O, as determined by the American Academy of Orthopedic Surgeons (1965). Testing room temperature was kept at  $25^{\circ}\text{C}$ .

## *Measures*

### *Goniometric Measurement*

The Myrin goniometer (Lic Rehab. 17183 Solna, Sweden) is a goniometer vertical and horizontal measurements based on Leighton flexometer (1955). It consists of a circular range (0-180th) degrees turntable and two indices. One indicator is mounted in the center of the disc controlled by gravity for vertical measurements and the other is an indicator of orientation for horizontal measurements. The measurement was performed using American Academy of Orthopedic Surgeons (1965) procedures. A manual goniometer was used to measure flexibility as the range of motion in the hip joint and related musculature, while the participant lay supine on a firm, level examining table. The examiner raised the tested leg slowly and evenly, with the knee fully extended, avoiding abduction and rotation, until tightness or pain restricted the movement. The upward motion of the straight leg was measured to the nearest degree from the zero starting position. The hamstring flexibility score was determined as the mean of two measurements of the left and right legs. Ekstrand et al. (1982) demonstrated the reliability of measuring joint range of motion as a measure of hamstring flexibility.

### Sit and Reach Test

The Sit and Reach test is a wooden device with the following dimensions: length of base 35cm, width 45cm, height 32cm and length 55cm. To standardize the measurement scale of Sit and Reach, a standard meter rule was placed on the sit-and-reach box for each test, with the reading of 23 cm in line with the heel position of each test. The participants sat on the floor with shoes on, and fully extended two legs so that the sole of the foot was flat against the end of the box. They extended their arms forward, placing one hand on top of the other. With palms down, they reached forward sling hands along the measuring scale as far as possible without bending the knee of the extended leg. Throughout testing, the physiotherapist checked to ensure that the heel remained at the 23 cm mark. Three trials were performed on one side. Then the participant changed leg position and repeated the procedure on the other side. The average of the three trials on each side was used for subsequent analyses. Reaches short of the toes were recorded as negative forward reach scores, and reaches beyond the toes were

recorded as positive forward reach scores. The forward reach scores were recorded in centimeters to the nearest 0.5 cm using the scale on the box (AAHPERD, 1984).

### Statistical analysis

For the statistical analysis the statistical package SPSS for windows (Statistical Package for the Social Sciences, Chicago, IL) was used. Descriptive statistics including means and standard deviations were calculated for all the variables. Independent Samples T-test was used to find statistically significant differences between untrained and trained students to assess the flexibility of the knee by the use of two different measuring methods. Significance level was set at  $p < 0.01$ .

## RESULTS

The anthropometric characteristics of student-athletes and students (non-athletes) are listed in Table 1. There were statistically significant differences between groups in weight ( $p < 0.01$ ).

TABLE 1.

*Anthropometric characteristics of students (non-athletes) and students (athletes).  
The values are averages  $\pm$  standard deviation.*

	Students(non-athletes)	Student-athletes
Age (years)	23.45 $\pm$ 0.44	23.08 $\pm$ 0.98
Height (cm)	1.89 $\pm$ 0.69	1.86 $\pm$ 0.97
Weight (cm)	84.56 $\pm$ 12.43	<b>91.00<math>\pm</math>13.46</b>

$p < .01$

The performance of student-athletes and the untrained students using the instrumentation of the Myrin goniometer and Sit and reach test appear in Table 2. There were statistically significant differences between the two groups when using the Myrin goniometer for the evaluation of knee joint's mobility ( $p < 0.01$ ).

## DISCUSSION

This study was designed with the assumption that the instrument plays a key role in

evaluating the mobility of a joint or a muscle group. Sit and reach test is commonly used in health-related and physical-fitness test batteries to evaluate the hamstring and lower back flexibility (Wells and Dillon, 1952; Jackson and Baker, 1986; Jackson and Langford, 1989; Hoeger et al, 1990; Liemohn et al 1994, Simoneau, 1998) and others included the Myrin goniometer (Chung and Yuen, 1999; Hui and Yuen, 2000; Baltaci et al, 2003).

Myrin goniometer (LIC rehab, 171 83 Solna, Sweden)) is often used to determine hamstring flexibility by executing a maximum,

passive straight-leg raise on each leg, (Ekstrand, Wiktorsson, Oberg, & Gillquist, 1982; Jackson & Baker, 1986; Jackson & Langford, 1989; Minkler & Patterson, 1994).

However, comparing these two instruments Kendall et al (1971) report that Sit and Reach test does not isolate the joint at the time of measurement and the final result would probably be due to physiological or limited length of the muscles of the knee, back and triceps surae muscle complex. Unlike the Myrin goniometer isolate the joint measurement, so the final result of measurement is the length of the extensor muscles (Moller & Oberg, 1984; Kippers & Parker, 1987).

Most research has not dealt with the issue of the effect of the measure instrument to the final result of the measurement of a joint mobility. In this study used two different instruments in order to determine whether the use of two different instruments for evaluation hamstring flexibility will affect the final result of measurement.

In this study, both students-athletes and students (non-athletes) had no statistically significant differences when used as an instrument for hamstring flexibility the Sit and Reach test. These results did not support the findings of Jackson and Baker (1986) and Chung and Yuen (1999) indicating that athletes have better statistical performance than non-athlete. Using the Sit and Reach test except for knee joint, back muscles and triceps surae muscle complex are involved (Kendall et al, 1971). Therefore the same performance between the two groups may be due to the physiological or limited length of back muscles, knee and triceps surae muscle complex.

Rather, when used as measuring instrument the Myrin goniometer differences between the two groups was statistically significant in favor of student-athletes. This result is in agreement with Kendall et al (1971) and Jackson & Langford (1989) indicating that athletes perform better than untrained subjects in evaluation of flexibility with the Myrin goniometer.

TABLE 2.

*Performance of student (non-athletes) and students-athletes in the evaluation of hamstring flexibility with the Myrin goniometer and the Sit and Reach test. The values are averages ± standard deviation.*

	Students(non-athletes)	Students-athletes
Goniometer Myrin (o)	82.00±3.14	<b>88.00±2.26</b>
Sit and reach test(cm)	21.98±2.17	22.40±1.18

p < .01

## CONCLUSION

Significant differences were only observed by the use of the Myrin goniometer for the evaluation of hamstring flexibility, in relation to Sit and Reach test, because it isolates the joint. In this study, knees joint mobility of trained and untrained individuals evaluated by the same score when used as a measure instrument the Sit and Reach test but this is likely due to the interference of other muscle groups in the measurement result. In contrast, trained student had higher results in the measurement of knees joint mobility from untrained student when using the Myrin goniometer, because the goniometer isolates the joint measurement, and the final result due

to the length of the extensor muscles without involving other muscle groups or joints.

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# PROCJENA FLEKSIBILNOSTI KOLJENA KORIŠĆENJEM DVA RAZLIČITA MJERNA INSTRUMENTA

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Razvoj fizičkih sposobnosti (snage, brzine, izdržljivosti i fleksibilnosti - American College of Sports Medicine, 1995) je jedan od glavnih preduslova za unapređenja i povećanja sportskih postignuća. Nekoliko sjedi-i-dohvati testova (SRs), za procjenu fleksibilnosti koljena i donjeg dijela leđa, se redovno koristi u baterijama testova koje su vezani za zdravlje i fizičku aktivnost. (Jackson & Baker, 1986; Hoeger et al, 1990; Hui and Yuen, 2000). Izvođenje ovih testova je jednostavno, lako za evidentiranje rezultata, zahtijeva minimalne sposobnosti koje su razvijene treningom i posebno je primjenljivo za procjenu fleksibilnosti u ovom prostoru. Klasični SR (Wells & Dillon, 1952), kao prvi konstruisani test, često je bio uključivan u fitnes programe vezane za zdravlje (A.A.H.P.E.R.D., 1984; Institute for Aerobic Research, 1988). Prilikom mjerjenja pokretljivosti zglobova važno je da se ograniči uticaj drugih mišićnih grupa ili zglobova na konačan rezultat mjerjenja. Prema Harrisu (1969), zglob mora da bude izolovan za vrijeme mjerjenja. Upotrebom Myrin goniometra zglob se izoluje od drugih zglobova i uticaja drugih mišićnih grupa na finalni rezultat. (Leighton, 1955) Za razliku od prethodnog testa, sjedi-i-dohvati test može da pokaže drugačije rezultate. Anatomska i biomehanička analizi pokazuju da na konačan rezultat ovog testa imaju uticaj mišići leđa, koljena i triceps surae. (Kendall et al, 1971)

Cilj ovog rada bio je da se ispita da li se upotrebom dva različita instrumenta za procjenu pokretljivosti zglobova koljena može uticati na konačan rezultat merenja treniranih i netreniranih osoba.

Četrdeset studenata (sportista) i četrdeset studenata (nesportista) učestvovali su u ispitivanju. Prosječna starost studenata

(sportista) je  $23,45 \pm 0,44$  godine, visina  $1,89 \pm 0,69$  cm i težina  $84,56 \pm 12,43$  kg. Antropometrijske karakteristike studenata (nesportista) su: visina  $1,86 \pm 0,97$  cm i težina  $91,00 \pm 13,46$  kg; a njihova starost bila je  $23,08 \pm 0,98$  godina. Studenti (sportisti) kao i studenti (nesportisti) nisu imali nikakvih mišićno-skeletnih problema prije mjerjenja.

Testiranje je izvedeno u sali za vježbanje. Sva mjerjenja su izvršena istog dana, i svi su testovi sprovedeni tako što su ispitanici bili u patikama. Učesnici su mogli da se odmore 20 minuta između testova. Jedna osoba (fizioterapeut) sprovodio je oba testa. Za procjenu pokretljivosti zglobova koljena korišćena su dva različita mjerna instrumenta: Myrin goniometar (Leighton, 1955) i sjedi-i-dohvati test (Wells & Dillon, 1952).

Za statističku analizu korišćen je SPSS statistički paket za Windows. Deskriptivna statistika, uključujući srednje vrijednosti i standardnu devijaciju, izračunate su za sve varijable. Za pronalaženje statistički značajnih razlika u procjeni fleksibilnosti koljena, sa dvije različite metode mjerjenja, između treniranih i netreniranih studenata, korišćen je T-test nezavisnih uzoraka. Traženi nivo značajnosti je  $p < 0,01$ .

Ustanovljena je statistički značajna razlika između ove dvije grupe kada se koristio Myrin goniometar za procjenu fleksibilnosti zglobova koljena ( $p < 0,01$ ). Nije pronađena statistički značajna razlika između treniranih i netreniranih ispitanika prilikom korišćenja sjedi-i-dohvati testa.

U ovom istraživanju primjenjena su dva različita instrumenta da bi se utvrdilo da li postoje razlike u rezultatima mjerjenja prilikom njihovog upotrebe. Poredeći ova dva instrumenta Kendall et al (1971) konstatiše da

sjedi-i-dohvati test ne izoluje zlob tokom mjerena i da konačan rezultat vjerovatno zavisi od ograničenja uslovljenih dužinom mišića leđa, koljena i triceps surae. Za razliku od toga Myrin goniometar izoluje zglob, tako da na konačan rezultat mjerena utiče samo dužina mišića ekstenzora (Moller & Oberg, 1984; Kippers & Parker, 1987). U ovom istraživanju i studenti (sportisti) i student (nesportisti) nisu pokazali statistički značajnu razliku kada je kao instrument za procenu fleksibilnosti koljena korišćen sjedi-i-dohvati test. Ovi rezultati nisu potvrdili zaključke Jackson i Baker (1896) niti Chung i Yuen (1999) koji su pokazali da sportisti, statistički gledano, imaju bolje rezultate od nesportista. Koristeći sjedi-i-dohvati test, osim zgloba koljena, u pokret su takođe uključeni mišići leđa i triceps surae (Kendall et al, 1971). Stoga, razlika u mjerenu između dvije grupe je

uslovljena uticajem mišića leđa, koljena i triceps surae na mjerenu. Drugim riječima, kada je korišćen Myrin goniometar razlike između dvije grupe su bile statistički značajne u korist studenata sportista. Ovaj rezultat je u saglasnosti sa Kendall et al (1971) i Jackson & Langford (1989) koji pokazuju da sportisti imaju bolje rezultate od netreniranih prilikom procjene fleksibilnosti sa Myrin goniometrom.

Značajne razlike primjećene su samo pri korišćenju Myrin goniometra, u odnosu na sjedi-i-dohvati test. Razlog tome je što prvi test izoluje zglob. U ovom istraživanju fleksibilnost koljenog zgloba treniranih i netreniranih osoba procijenjena je sa potpuno istim rezultatom kada je kao merni instrument korišten sjedi-i-dohvati test, a uzrok tome je uticaj drugih mišićnih grupa na rezultate mjerena.

**Ključne riječi:** koljena, Myrin goniometar, sjedi-i-dohvati test.

# THE LINK OF A COACH'S PERCEPTION OF LOCUS OF CONTROL AND HIS/HER MOTIVATIONAL APPROACH TO ATHLETES

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## SUMMARY

The locus of control is related to the perception of the cause of certain events. It is considered a general personality orientation, a kind of personal disposition, and can be internal and external. When the locus of control is internal, it is said to be autonomous, while external causality can be controlled (by others) or it can be impersonal (under the influence of a coincidence or luck). The approach in working with athletes can be based on supporting autonomy or behavior control. The aim of this explorative research was to determine the type of locus of control of future sports coaches, the a priori motivational approach to athletes and the potential link between the two variables. It has been presumed that coaches with an internal locus of control i.e. those who believe that they themselves are in control of events in their lives, would be more inclined, in working with athletes, to apply the approach based on supporting autonomy. The sample consisted of 122 examinees, students of coaching at the College of Sports and Health in Belgrade. The results confirmed the preliminary hypothesis and showed that the autonomous causality orientation (internal locus) dominates, linked with a supporting approach. The controlling and impersonal orientations (external locus) are related with the approach which reinforces behavior control in athletes. Especially relevant is the fact that the approach to athletes which is based on a moderate supporting of athlete autonomy is linked with all three causality orientations. It is relevant to further investigate which factors, personal and environmental, impact the orientation of the coach towards the supporting approach. Supporting athlete autonomy is an important issue, not only in a theoretical sense, but practical as well, as it has positive consequences on the psychological development and mental health of athletes, especially the younger categories.

**Key words:** coach's motivational approach, locus of control, supporting athletes' autonomy, control of athletes' behavior

## INTRODUCTION

Starting from the basic premises of the self-determination theory (Deci & Ryan, 2000; Mladenović, 2010), research has shown that the support of autonomy has a positive impact on the entire development of the personality and mental health (Ryan & Deci, 2007). However, research has also shown that the motivational approach in sports which is based on

behavior control continues to prevail (according to Mageau & Vallerand, 2003).

In accordance with the self-determination theory, it can be presumed that the locus of control as a type of dispositional personality orientation can have a significant link with the option of the coach to direct his motivational approach to athletes towards supporting autonomy or behavior control.

The belief in the possibility or impossibility

of controlling events and happenings in life is called locus of control. If an individual is convinced that he/she is controlling events in his/her own life, then it is said that they have an internal locus of control. When there is the conviction that some external factors are controlling events and happenings in life, there is an external locus of control (according to Cox, 2005).

Starting from these basic concepts of the theory of attribution, Deci and Ryan developed the concept of causality orientations (Deci & Ryan, 1985). They determined causality orientations to be relatively permanent personal characteristics and made a distinction between autonomous, controlling and impersonal orientations towards the cause of events.

The autonomous causal orientations (inner locus) indicate the degree to which a person is directed towards the aspects of the environment which incite intrinsic motivation, enable optimal challenges and offer feedback on personal efficiency for a specific task. The individuals in whom these types of causal orientations are represented to the greatest degree will demonstrate much more personal initiative than individuals in whom the other two causal orientations dominate. They will seek actions which are appealing and which represent a personal challenge and will assume responsibility for their own behavior.

The controlling causal orientation (external locus) indicates the degree to which the person is directed towards awards, deadlines, ego-involvement, structurality and directness which comes from others. Individuals in whom this causal orientation dominates rely on awards and other types of social control. Such individuals are to a large extent "adjusted" to the demands of others, and not to what they demand from themselves. Feedback information is directed towards the maintaining of self-worth and a positive self-image, and not on efficiency in responding to a specific task.

An impersonal causal orientation indicates the degree to which an individual believes that the achieving of an aim or result is entirely outside his or her control, and that a specific achievement is largely the result of coincidence or luck. Those in whom this causal orientation

dominates usually feel very anxious and inefficient. They feel they cannot in any way have an impact on events or deal with the set demands or the occurring changes. They tend to be deficient on motivation and harbor the desire that everything remains "as before."

It is considered (according to Deci & Ryan, 1985) that, to a certain extent, every person possesses all three causality orientations, so it is possible to speak about individual differences. Research studies in various areas have shown that an autonomous orientation is generally linked with greater self-respect, ego development and self-actualization (according to Deci & Ryan, 1985) as well as greater personality integration (Koestner, Bernieri, & Zuckerman, 1992).

To be autonomous means to manage one's self and actions independently. When autonomous, people are totally willing to do what they are involved with and perform with interest and dedication. Behavior is controlled when the individual is under pressure to do something. When there is control, there is no subjective sense of agreement to perform (Ryan & Deci, 2007).

The coach base his motivational approach on supporting the autonomy of athletes, if he respects and values the personality of each athlete. He also stimulates the personal responsibility of the athlete by offering the possibility of choice within the framework of the given rules, and offering explanations for the set tasks, as well as enabling the athlete to develop initiative and autonomy in work (Mladenović, 2008). Such a coach has the ability of empathy and is capable of seeing the point of view of another person. The feedback on the competence of the athlete regarding the specific task is always in an "informing" and not a controlling form (Lazarević, 2001).

Behavior control is related to the pressure to behave and think in a certain way (Deci & Ryan, 1985). It includes the use of threats, physical force, supervising, psychological control, inducing the feeling of guilt and self-criticism, as well as the application of material rewards and feedback information on competence in a controlling way (Mageau & Vallrand, 2003).

In the context of sports, it is presumed that

coaches who a priori on the level of personal traits manage different orientations on the cause of events would have a different attitude towards athletes.

The coaches who believe that they impact events in their own lives will probably be convinced that they can exert influence on their athletes as well, that is, on their personal and sports development. These "sorts" of coaches will essentially respect individual differences, the inner states and feelings of athletes and support their autonomy in work. In this way, athletes are enabled to develop their locus of control and feelings of personal responsibility themselves. Fostering the approach which is based on respect and valuing the athlete is significant, not only for achieving top sports results but also for the mental health and development of young athletes.

The coaches who believe that events in their lives largely depend on certain external factors, such as other people, coincidence or luck, will be more inclined to demonstrate a much larger degree of control in working with athletes. Coaches such as these put more value on the use of control and focus more attention on authority. They will endeavor to secure the compliance of the athlete, to shape their way of thinking and behavior and will use extrinsic rewards for every progression in that sense.

The motivational approach of a coach in working with athletes is especially significant in working with younger categories of athletes. It is important theoretical as well as practical issue.

The aim of this explorative research was to test if there is a link between the locus of control and the coach's motivational approach towards athletes.

According to the self-determination theory, the general assumption was that future sports coaches who believe that they themselves manage events in their lives (the autonomous causality orientation – inner locus) would be more inclined to develop a motivational approach which is based on supporting the autonomy of athletes. On the other hand, it is assumed that the controlling and impersonal causality orientations will be linked with favoring the motivational approach which is based on controlling athletes' behavior.

## METHOD

### *Sample*

The sample consisted of 122 examinees, first and second-year students of the Sports College of Belgrade, from the sports coaching department. The higher percentage of the examinees was males (78.7%), with 21.3% female examinees. The age of the examinees was from 19 to 38. More than half of the examinees (54.1%) were aged between 19 and 22, while only 10% examinees were over 28.

### *Variables*

Two variables were used – the causality orientation of the coach and the motivational approach. The causality orientation was operationalized as autonomous, controlling and impersonal. The motivational approach of the coach was operationalized as high autonomy, moderate autonomy, moderate control and high control of athlete behavior.

### *Procedure*

The respondents participated in the research voluntarily and had the option to leave at any chosen point in time. In the instructions for filling out the questionnaire, the respondents were told they were participating in a research which has the aim to test how future sports coaches reason about various topics. It was stressed that there are no correct or wrong answers, but that it is important to respond honestly to the items, as well as that participation in the research or the nature of the responses given in the questionnaire will in no way impact the respondent's standing. Thus a potential social suitability of the response was avoided, as the questionnaires were filled out during lectures in Psychology of Sports and the Psychological Preparations of Athletes.

### *Instruments*

Two instruments were used in the research.

The General Causality Orientation Scale was used to gauge causal orientations. The original instrument contains 12 vignettes and 36 items (Deci & Ryan, 1985). Each vignette

describes a typical social situation or an achievement situation and is backed up with descriptions of possible reactions to situations which reflect an autonomous, controlling or impersonal causal orientation. On a seven-degree Likert-type scale, the examinee indicated to what extent it is possible to react in the described situation in each of the depicted ways. The scores on each of the three subscales (autonomous, controlling, and impersonal) reflected the relative representation of causal orientations. The reliability of the instrument in this research has been determined by Cronbach's alpha equal to .75.

To test a coach's motivational approaches, a Scale of the Motivational Orientation of the coach was constructed for the needs of this research. The scale was modeled after similar instruments intended to test the motivational approach of individuals who are in some sort of position of authority, such as for example teachers (Deci, Schwartz, Sheinman & Ryan, 1981; Reeve, Bolt, & Cai, 1999). The coaches' scale of motivational orientation consisted of 8 vignettes and 32 items. The vignettes described potential situations in which coaches can find themselves while working with younger athletes. An example is this story: "Marko is 10 years old and has been training football successfully. During the last two weeks, however, he has become in some way disinterested and indifferent. He goes to training, but it is obvious he doesn't put much effort in it. A phone conversation with his mother lacked to disclose any useful information. The best thing for his coach to do is..." For every described situation in one of the 8 stories, four possible ways of reacting were on offer: high autonomy ("to make it clear to him that it's not the end of the world because he's not training well and to try to help him to discover the cause of his disinterest and indifference"), moderate autonomy ("to help him cope with the game and with the effort of the other children and to encourage him to keep up with the others"), moderate control ("it should be made clear to him that it is important to put forth more effort if he wishes to progress"), high control("to leave him to train additionally after every training session, until he gets better"). The examinee

was asked to express his or her opinion on the seven-degree Likert-type scale on how appropriate each of the four described reactions was. The scale was applied for the first time in this research study and at present, except for reliability, no other metric properties are known. The value of Cronbach's alpha was .81.

### *Statistical analysis*

The reliability of the instruments was tested out by the Cronbach alpha. For each of the three types of causal orientation and all four variants of the coach's motivational approach, the arithmetic mean and standard deviations were calculated. The significance of the arithmetic mean was tested by the application of the t-test. The degree of linkedness of causal orientation and motivational approaches was determined by calculating the Pearson's coefficient correlation. Data processing was done alternatively as well – without an outlier.

## RESULTS

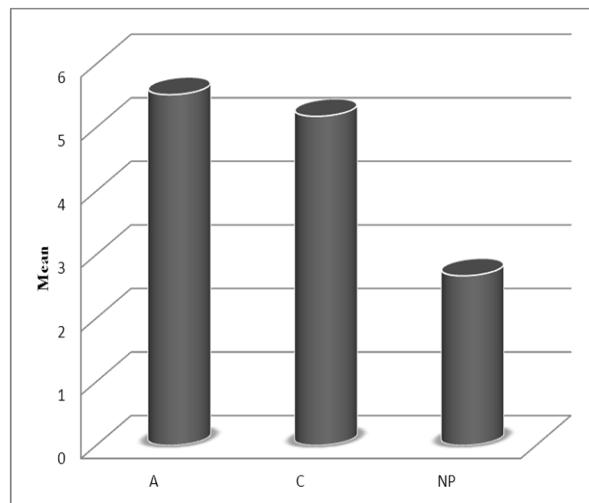
As Diagram 1 shows, the testing of the locus of control showed that the autonomous orientation was represented in future sports coaches to the largest degree ( $M=5.20$ ;  $SD=.67$ ;  $t=85.120$ ;  $p<.01$ ), followed by controlling ( $M=4.58$ ;  $SD=.66$ ;  $t=76.520$ ;  $p<.01$ ), while the impersonal causality orientation was present the least ( $M=2.74$   $SD=.95$ ;  $t=31.747$   $p<.01$ ). All means values differences were significant, and the analysis was done without outliers as well (Addendum 1).

The obtained results indicate that future coaches to the largest degree possess an inner locus of causality i.e. the belief that they have control over events in their lives. To a somewhat lesser degree is present the belief that external factors (e.g. other people) manage their lives. Impersonal causality, as the reflection of some kind of learned helplessness, is represented the least as a general orientation with young coaches.

The results further indicate that a high orientation towards autonomy dominates as an approach to athletes ( $M=5.52$ ;  $SD=.71$ ;  $t=86.561$ ;  $p<.01$ ). The approach which is based on moderate control of athlete behavior

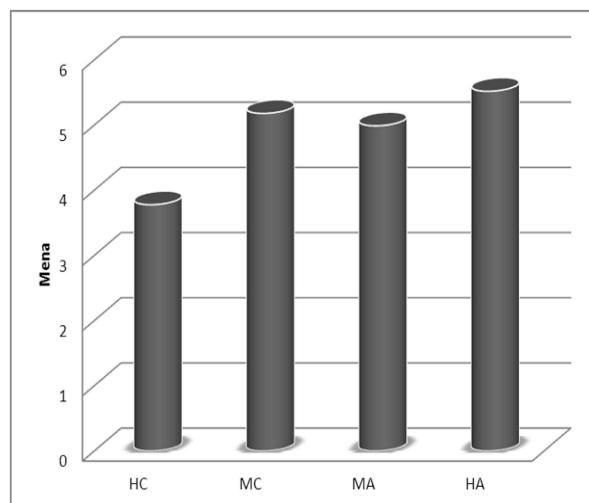
follows ( $M=5.12$ ;  $SD=0.83$ ;  $t=67.618$ ;  $p<.01$ ), then the approach which is characterized by a moderate support of autonomy ( $M=4.95$ ;  $SD=.87$ ;  $t=62.544$ ;  $p<.01$ ), while a high orientation towards the control of athlete behavior ( $M=3.79$ ;  $SD=.91$ ;  $t=45.929$ ;  $p<.01$ ) is on the last place. (Diagram 2)

**DIAGRAM 1**  
*The locus of control of sports coaches*



Legend: **A** – autonomous causality orientation (inner locus); **C** – controlling causality orientation (external locus); **NP** – impersonal causality orientation;

**DIAGRAM 2**  
*Sports coaches' motivational approaches to athletes*



Legend: **HA** – high autonomy; **MA** – moderate autonomy; **HC** – high control; **MC** – moderate control;

The values of the t-test show that the means values are statistically significant, but the high values of the standard deviation point to potential individual differences, especially in regards to the approach which is based on athlete control. Thus the analysis was completed alternatively as well – without outliers. By removing the outliers, the individual variations in responding to items which measure four approaches to athletes are reduced, though the entire approach to athletes remains unchanged (Addendum 2).

The results of the correlational analysis show that approaches to athletes are linked with causality orientations (Table 1). The correlational analysis was also done without outliers (Table 2), but except for specific values of certain coefficients of correlations, the results did no change significantly.

The approach which is based on a moderate or high support of autonomy of athletes is significantly linked with the autonomous causality orientation. The controlling approach of the coach, regardless whether it involves a high or moderate control of athlete control, significantly correlates with controlling and impersonal causality orientations. However, the approach of a coach who moderately supports the autonomy of an athlete is significantly linked not only with the autonomous, but also with the other two causality orientations – controlling and impersonal.

The approach to athletes is not just a theoretical, but also a practical issue. The relationship between a coach and an athlete is a reciprocal process in which the coach and the athlete mutually influence each other. Coaches do not behave in the same way towards all athletes. The behavior of a coach in specific situations is a reaction to perceived behavior and the motivation of the athlete. However, a personal causality orientation of the coach, as a more permanent dispositional orientation, can significantly impact the a priori attitude regarding the most effective approach to athletes.

The results of this research show that future sports coaches to the largest degree have an internal locus of control, i.e. they believe that the events in their lives are under

their control. In turn, they attribute the effects of their activities to causes such as abilities and vested effort. Such a causality orientation in life, generally speaking, is linked with the approach to athletes which is operationalized as a high orientation towards autonomy. This finding confirms the basic hypothesis of the

research. Coaches who believe they have control over events in their lives will most probably, regardless of the nature of external influences, retain the conviction that the valuing of the personality of the athletes and support for their autonomy is relevant and necessary.

TABLE 1.

*The correlation of the motivational approach to athletes with the causality orientations of coaches (N=122)*

Motivational approach of coach	Causality orientations		
	autonomy (inner locus)	control (external locus)	impersonal causality
High autonomy	.359	-.072	.108
Moderate autonomy	.252	.320	.390
Moderate control	.131	.394	.292
High control	.028	.333	.402

p < .01

TABLE 2.

*The correlation between the motivational approach to athletes and causality orientations of coaches (without outliers, N=101)*

Motivational approach of coach	Causality orientations		
	autonomy (inner locus)	control (external locus)	impersonal causality
High autonomy	.300	-.090	-.011
Moderate autonomy	.171	.268	.216
Moderate control	.065	.367	.268
High control	-.135	.220	.210

p < .01

With one part of the tested future sports coaches, it was shown that the causality orientation according to which responsibility for life events rests on factors outside the personality itself – other people, coincidence or luck, a “higher power” - dominated. Such a dispositional orientation can extend from the undeniable fact that the individual is not always the sole factor which determines the results from life events, to the concept of learned helplessness according to which every activity depends on some impersonal force on which there is no impact. Future sports coaches which adopt such an external locus on the level of personality disposition, regardless whether it's a controlling or impersonal orientation, will be more inclined in practical work with athletes to apply the negative

approach, giving an advantage to behavior control.

However, especially significant is the result that the approach which is based on a moderate support of athlete autonomy correlates with all three causality orientations. After excluding the outliers from the analysis, what remains is only a link with controlling and impersonal causality orientations. The link of the approach to athletes which is based on a moderate support of autonomy and the external locus of control appears at first incompatible, but this correlation should be further investigated.

A finding such as this in the psychological sense is very encouraging, as it points to the fact that young people who in their lives are faced with the impossibility to entirely impact the results of their own activities, events and

happenings, show tendencies, on the level of personality disposition, to influence others they can have an impact on, by applying a different approach from the one they themselves were exposed to.

## CONCLUSION

A motivational approach to working with athletes, especially younger categories, can have far-fetching consequences not only on future sports successes of young athletes but also on their entire mental development and mental health.

The results of this research have shown that future sports coaches who at the level of personal disposition have an internal locus of control (autonomous causality orientation)

show an a priori attitude that, in working with athletes, respect, valuing and supporting of athlete autonomy should be shown. Future sports coaches who on the level of general dispositional characteristics incline towards an external locus of control (controlling and impersonal causality orientation) favor the approach towards athletes which is based on behavior control.

For further empirical research, but also for a systematic training of future sports coaches, of relevance is the fact from this research which points to the existing of a link between the external locus of control and the tendency to apply the approach which is based on a moderate supporting of autonomy in working with athletes.

## ADDENDUM 1.

*Causality orientation of sports coaches (without outliers, N=101)*

Causality orientation	M	SD	t-test	Degrees of freedom
Autonomy (inner locus)	5.29	.49	<b>107.736</b>	100
Control (external locus)	4.57	.61	<b>75.440</b>	100
Impersonal causality	2.67	.81	<b>33.250</b>	100

p < .01

## ADDENDUM 2.

*Predictor variables significance for some trainer job satisfaction prediction*

Motivational approach of coaches	M	SD	t-test	Degrees of freedom
High autonomy	5.52	.63	<b>87.245</b>	100
Moderate control	5.18	.76	<b>67.907</b>	100
Moderate autonomy	4.99	.76	<b>65.510</b>	100
High control	3.78	.76	<b>49.516</b>	100

p < .01

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# POVEZANOST TRENEROVE PERCEPCIJE LOKUSA KONTROLE I MOTIVACIONOG PRISTUPA SPORTISTIMA

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Polazeći od osnovnih premissa teorije samodeterminacije (Deci & Ryan, 2000; Mladenović, 2010), istraživanja su pokazala da podržavanje autonomije pozitivno utiče na cijelokupan razvoj ličnosti i mentalno zdravlje (Ryan & Deci, 2007). Međutim, istraživanja takođe pokazuju i da u sportu uglavnom i dalje preovlađuje motivacioni pristup trenera koji se zasniva na kontroli ponašanja (prema Mageau & Vallerand, 2003).

U skladu sa teorijom samodeterminacije, može se pretpostaviti da bi lokus kontrole kao jedna vrsta dispozicione orijentacije ličnosti mogao značajno da bude povezan sa opredjeljenjem trenera da svoj motivacioni pristup sportistima usmjeri u pravcu podržavanja autonomije ili kontroli ponašanja.

Lokus kontrole određuje se kao uvjerenost u mogućnost da se utiče na događaje i zbijanja. Smatra se opštom orijentacijom ličnosti, koja je jedna vrsta personalne dispozicije (Deci & Ryan, 1985). Kada je lokus kontrole unutrašnji kaže se da je autonoman, dok spoljašnja uzročnost može biti kontrolisana (drugim osobama) ili nepersonalna (pod uticajem "više si le").

Trener koji vjeruje da može da utiče na događaje u svom životu biće uvjeren da može da utiče i na svoje sportiste, na njihov optimalan sportski i psihički razvoj. Takav trener biće tolerantniji na individualne razlike među sportistima, postavljaće optimalne izazove pred svakog sportistu i podržavaće razvoj lične odgovornosti.

Trener kod kojeg dominira uverenje da nješovim životom upravljaju neki spoljašnji faktori biće sklon da i sam u radu sa sportistima demonstrira kontrolu ponašanja. Iako kontrola ponašanja, nadzor, pritisak, primjena kažanjivanja itd. mogu naizgled brzo i efikasno da utiču na ponašanje sportista, dugoročno ne obez-

bjeđuju uslove za optimalan sportski i psihički razvoj mlađih sportista.

Cilj ovog eksplorativnog istraživanja bio je da se utvrdi kakav lokus kontrole postoji kod budućih sportskih trenera, kakav je a priori pristup sportistima i da li između te dvije varijable postoji povezanost. Polazeći od glavnih premissa teorije samodeterminacije, postavljena je glavna hipoteza da će treneri sa unutrašnjim lokusom kontrole tj. oni koji vjeruju da sami kontrolišu događaje u svom životu, biti skloniji da u radu sa sportistima primjenjuju pristup koji se zasniva na podržavanju autonomije.

Uzorak se sastojao od 122 ispitanika, studenata prve i druge godine Visoke sportske i zdravstvene škole strukovnih studija iz Beograda, smjer – sportski trener. Najveći procenat ispitanih bio je muškog pola (78,7%), a ispitanika ženskog pola bilo je 21,3%. Starost ispitanika bila je od 19 do 38 godina. Više od polovine ispitanih (54,1%) bilo je starosti od 19 do 22 godine, dok svega 10% ispitanika ima preko 28 godina.

Za ispitivanje lokusa kontrole upotrebljena je Skala opšte orijentacije uzročnosti (General Causality Orientation Scale). Vrijednost Kronbahove alfe u ovom istraživanju iznosila je 0,75. Za ispitivanje motivacionih pristupa trenera konstruisana je Skala motivacione orijentacije trenera. Pouzdanost instrumenta bila je zadovoljavajuća (Kronbahova alfa 0,81).

Za svaki tip kauzalne orijentacije i svaki od četiri motivaciona pristupa izračunavane su aritmetičke sredine i standardne devijacije. Značajnost aritmetičkih sredina provjeravana je t-testom. Povezanost kauzalnih orijentacija i motivacionih pristupa provjeravana je korelacijonom analizom.

Ispitivanje lokusa kontrole pokazalo je da je kod budućih sportskih trenera u najvećem stepenu zastupljena autonomna (AS= ,20; SD=0,67; t=85,120; p<0,01), pa kontrolišuća

(AS=4,58; SD=0,66; t=76,520; p<0,01), dok je nepersonalna orijentacija uzročnosti najmanje prisutna (AS=2,74; SD=0,95; t=31,747; p<0,01). Sve dobijene aritmetičke sredine su statistički značajne.

Rezultati dalje pokazuju da kod budućih sportskih trenera kao pristup sportistima dominira visoka orijentacija na autonomiju (AS=5,52; SD=0,71; t=86,561; p<0,01). Slijedi pristup koji se zasniva na umjerenoj kontroli ponašanja sportista (AS=5,12; SD=0,83; t=67,618; p<0,01), pa pristup koji karakteriše umjerno podržavanje autonomije (AS=4,95; SD=0,87; t=62,544; p<0,01), dok je visoka orijentacija na kontrolu ponašanja sportista (AS=3,79; SD=0,91; t=45,929; p<0,01) na poslednjem mestu.

Korelaciona analiza pokazuje da postoji značajna povezanost između unutrašnjeg lokusa kontrole i pristupa koji se zasniva na visokom (0,359; p<0,01) i umjerenom (0,252; p<0,01) podržavanju autonomije sportista.

Spoljašnji lokus kontrole značajno i pozitivno korelira sa pristupom koji se zasniva na visokoj (0,333; p<0,01) i umerenoj (0,394; p<0,01) kontroli ponašanja, ali i sa umjerenim podržavanjem autonomije sportista (0,320; p<0,01). Uvjerenost u nepersonalnu kauzalnost u sопственом životu najviše je povezana sa orijentacijom trenera na kontrolu ponašanja sportista (0,402; p<0,01).

Za dalja empirijska istraživanja, ali i za praktičan rad na edukaciji budućih sportskih trenera, značajna je povezanost pristupa koji se zasniva na umjerenom podržavanju autonomije sportista sa sve tri orijentacije uzročnosti. Takav nalaz je u psihološkom smislu vrlo ohrabrujući, jer ukazuje da mladi ljudi koji se suočavaju sa nemogućnošću da u potpunosti utiču na događaje u svom životu, pokazuju tendenciju da prema onima na koje imaju prilike da utiču primjene drugačiji pristup od onog kojem su sami bili podvrgnuti.

**Ključne riječi:** motivacioni pristup trenera, lokus kontrole, podržavanje autonomije sportiste, kontrola ponašanja sportsite.

# PREGNANCY - THE STATE OF CHANGES IN THE FIELD OF MOTIVATION ASPECTS FOR SPORT EXERCISING TOO

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## SUMMARY

The article presents the results of the survey among 163 pregnant women before pregnancy, at the end of the first triad, and at the end of the second triad of pregnancy. The survey questions encompass the field of motivation for sport activity. The questionnaire consists of 23 statements concerning the motivation before and 25 statements concerning motivation during pregnancy. Individuals define their own motive for sport activity on the five-degree scale. We analyzed the repetition frequencies of all the motives in all three stages of pregnancy and established the crucial motives for engaging in sport activities before and during pregnancy. Motivational structures are relatively permanent structures of cognitive-conative area which begin to form in the early childhood; therefore we expect these chosen motives to appear in all stages. We ascertained that pregnant women should be as much as possible acquainted with the influence and significance of sport activity on their own and their child's health and wellbeing since these are the leading motives in all three stages of our measuring. Motives within motivational structure may change in specific circumstances. This is established by our findings as well as during pregnancy the motives of health of unborn child and positive influence of mother's wellbeing on child take high frequencies of occurrence.

**Key words:** motivational structure, sports activities, pregnancy.

## THE SUBJECT AND THE PROBLEM

Exercising beneficially affects health of pregnant women and developing fetus and at the same time it is also a good preparation for a birth. Exercising also helps overcome some of pregnancy problems like constipation, tiredness, morning sickness and vomiting, more frequent urination, sleepiness and pains in the lower part of the stomach. Exercising by recommendations of many research findings (Brown, 2002; Lochmuller & Friese, 2004) relaxes and beneficially influences psychological state of health, strengthens cardiovascular system, it is a good preparation of pelvic floor muscles for delivery, it gains less fat weight during pregnancy and relieves backaches and pains in other joints. Special exercises for pel-

vic floor muscles not only help to strengthen muscles during pregnancy but also influence on shorter second pregnancy period because then a pregnant woman is more aware of the function of mentioned muscles and is able to relax them at the right time. In that way she can take an active part in delivery process which can now be faster and easier (Gamberger & Videmšek, 2005).

Women, who exercised regularly before becoming pregnant, can continue their program even throughout pregnancy if it goes on normally. Many studies have shown (Pivarnik et al., 1993; Wolfe et al., 1999) that from early second trimester of pregnancy exercises should be of moderate-intensity to medium-intensity aerobic activity where heart beat does not exceed 140 beats per minute and it is recommended to perform them three to four

times in a week in duration of 25 – 60 minutes. With such an extent of exercise the loss of aerobic power is minimal and they'll gain less fat because of constant ongoing fat use (Clapp & Little, 1995).

The aim of an active pregnant woman is to achieve many-sided positive affects. Benefits of regular exercising during pregnancy are: full muscular system strengthens which helps a pregnant woman to put up with additional strains easier throughout pregnancy and delivery; pregnant women learn how to control muscles – in this way during the process of delivery only specific groups of muscles are activated which is important for economical use of oxygen; muscles become more elastic so that women can regain their pre-pregnancy body back more quickly; the blood circulation increases which prevents varicosity and the baby gets more oxygen needed for his well-being and healthy development; the whole organism strengthens and gets ready for the events during delivery which can so be shorter and easier; physical and psychic condition improves and working ability maintains until high pregnancy; the feeling of safety during exercising maintains and accelerate the pleasure of exercising; a positive attitude toward pregnancy is developed and with that related mental well-being and serenity, it also prevents depression (Klun, 1992).

Goals of exercising that a certain pregnant woman has, differs from her pre-pregnancy goals. Exercising itself is more than just toning muscles and developing motor abilities, it is about keeping acquired abilities and getting even more focused on performance of movement. Throughout pregnancy exercising is more relaxed with lower intensity. Pregnant women should not gasp for breath during exercising and not at all get exhausted. Throughout pregnancy they should not start new sports or should avoid exercises with higher risk of injuries by using different requisites or risk of falling (Brown, 2002). They should work out in extent and with intensity that provides relaxation and well-being.

So, which are the motives that are essential for exercising in pre-pregnancy and throughout pregnancy? When we talk about motivational currents, we think about those in which

an individual regardless to the awareness, regardless to theoretical knowledge, sees a vital benefit.

The level of individual's adaptation to living conditions depends on the level of effectiveness of motivational currents. Predomination of one or more motives over the others is a consequence of many different life situations and individual experience (Černohorski, 2001). Pregnancy as a condition full of physiological and psychological changes influences also on changes of motives that an individual pregnant woman has.

Many different ways of finding out motives are known, many of them can be quite complicated (they move on a base of establishing a latent space), and the others are very simple. In our case the most common and interesting reasons and answers were found for the needs of this study and were offered to women as a questionnaire. In one of the most important studies concerning motives or reasons for exercising appeared: good health and well-being, good physical and working abilities, having fun, amusement, relaxation, and pleasure in exercising, competition, physical effort, sports appearance and a friend's life style (Zavrsnik, Pisot, Zurec, Žerjal, 2004). We have adjusted the assortment of motives to specialties throughout pregnancy.

## RESULTS AND DISCUSSION

Our findings show that pregnancy as a state full of physiological and psychological changes has an influence on changes of motives of an individual woman. Following motives appeared with the highest frequency in pre-pregnancy: I want to be physically efficient, I want to keep my health, I want to improve my health and I want to be a good example for my children. Motives, less important are: competition, business reasons and sympathy towards trainers.

From the moment when a woman realizes she's pregnant, everything is adapted to the growing creature inside of her, beside old motives new ones appear and they stay relatively stable throughout pregnancy. Even two new

motives appear: the health of unborn baby and a positive influence of mother's well-being on her baby. The less important motives in pre-

pregnancy have even throughout pregnancy the lowest frequency of appearance.

TABLE 1.  
*Changes of motivational structure for exercising throughout pregnancy*

Motives for exercising	Pre-pregnancy	Throughout first trimester	Throughout second trimester
My well-being means a lot to me.	4.61	4.63	4.69
I want to be with my friends.	2.68	2.59	2.57
I want to release my energy.	3.62	3.21	3.20
I want to stay in a good shape.	4.09	4.12	4.09
I enjoy group workout.	2.52	2.26	2.37
I want to learn new skills.	2.64	2.31	2.27
I want to meet new friends.	2.69	2.57	2.55
I want to release tension.	3.72	3.33	3.30
I like doing something.	3.50	3.44	3.36
I like going out of my house.	3.75	3.75	3.64
I like the competition.	1.64	1.48	1.48
I like being in a group.	2.27	2.16	2.13
I want to make a progress to a higher level.	2.42	2.10	2.18
I want to be physically efficient.	4.03	4.13	4.13
I want to stay healthy.	4.56	4.42	4.36
I like my trainers.	1.62	1.63	1.64
I like having fun.	3.12	2.96	2.89
I want to keep aesthetic appearance of my body.	3.70	3.63	3.58
I want to improve my health.	4.21	4.05	4.12
I want to be in touch with a social life.	2.69	2.53	2.55
When becoming older I want to be fit.	3.93	3.75	3.71
I want to be a good example for my children.	4.06	3.96	3.98
I am active for business reasons.	1.74	1.51	1.50
I want to do everything possible for my health and for the health of my baby.	.00	4.68	4.72
My well-being positively affects my baby.	.00	4.73	4.73

The importance of individual motive for exercising has pregnant women defined on a scale from 1 (unimportant) to 5 (very important). Since we've wanted to establish how motivational structure throughout pregnancy changes, we asked pregnant women about motives in pre-pregnancy, at the end of first trimester and at the end of second trimester of pregnancy. The upper table shows the frequency of choice or the meaning of a certain

motive among presented ones for exercising in all three periods of measurement.

Throughout pregnancy, as expected, appeared motives for exercising that are connected to a special state of two-in one body. 81,6% of asked evaluated as very important their own and the baby's health and 84% of all asked evaluated as very important their own well-being which positively influences on baby's health.

## CONCLUSION

A pregnant woman puts off a concern about her future because of being preoccupied with present events and near future. Winnicott (Praper, 1995) talks about primary maternal preoccupation, which does not necessarily lead to absolute withdrawal from her everyday needs and needs of the others. We can look at that not just as a product of physical part of pregnancy but also as a phase of changes their own old habits which are now focused into an interest for the future concerning the baby. That's why it is expected that new motives will join to the old ones and all together are now focused on mother's well-being, her good health and positive influence on a developing baby.

Our results showed invigoration of motives connected to health and well-being and by development of pregnancy they were more and more focused on a baby. The stronger the motives for exercising, the greater is probability for a pregnant woman to satisfy her own needs and desires in a frame of a healthy life style.

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# TRUDNOĆA – STANJE PROMJENA I U PROSTORU MOTIVACIJE ZA BAVLJENJE SPORTOM

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U radu su prikazani rezultati ankete 163 trudnice prije, na kraju prvog i na kraju drugog tromeseca trudnoće. Anketna pitanja su bila iz motivacije za bavljenje sportskim aktivnostima. Upitnik je sadržavao 23 ajtema iz prostora motivacije prije trudnoće i 25 ajtema u trudnoći. Ispitanice su se opredjeljivale o motivaciji za sportskim aktivnostima na petostepenoj skali.

Motivacija za redovnim bavljenjem sportom proizilazi iz činjenice da su ustanovljeni brojni pozitivni efekti vježbanja tokom trudnoće. Sportske aktivnosti pozitivno djeluju na zdravlje trudnice, razvoj fetusa i pripremu za porođaj. Vježbanje takođe pomaže da se prevaziđu neki lakši problemi tokom trudnoće, kao što su opstipacija, umor, mučnina i vomitus, učestalo mokrenje, pošpanost i bolovi u donjem dijelu stomaka. Sport i fizičke aktivnosti imaju pozitivan uticaj na psihološko stanje, jačaju kardiovaskularni sistem, pripremaju karličnu muskulaturu za porođaj, pomažu u održavanju tjelesne težine i sprečavaju bolove u krstima i drugim zglobovima. Vježbanjem tokom trudnoće muskulatura karlice postaje snažnija i izdržljivija. Na taj način trudnica aktivno učestvuje u porođaju, što dovodi do bržeg i lakšeg poroda.

Analizirana je učestalost pojave svih motiva u sva tri perioda i određeni su motivi koji su od presudnog značaja da se trudnice uključe u sportske aktivnosti prije i u toku trudnoće. Kako bi mogli utvrditi okvire motivacione efikasnosti potrebno je ustanoviti šta trudnice posredno i neposredno motiviše. U osnovi svake motavice je zadati cilj. Cilj je lako odrediti ako se zna čemu ispitanica teži. Ciljevi vježbanja, koje trudnica postavlja, se razlikuju od njenih ciljeva prije trudnoće. Za razliku od vježbanja prije trudnoće, u kome se akcenat daje na oblikovanje mišića, razvoj motoričkih sposobnosti, razvijanje izdržljivosti i samo

izvođenje vježbe, u trudnoći su vježbe jednostavnije i izvode se sa manjim intenzitetom. Trudnice prije svega trebaju da upražnjavaju vježbe disanja ali pri tome ne smiju da pretjeruju. Tokom trudnoće ne bi se trebale koristiti nove (nepoznate) sportske aktivnosti, kako ne bi došlo do povreda. Vježbanje treba povoditi u takvom obimu i intenzitetu koje omogućava trudnicama opuštanje i dobro raspoloženje.

Motivacione strukture su relativno trajne strukture kognitivno-konativnog prostora i počinju se razvijati u ranom djetinjstvu. Zato se može očekivati da će se odabrani motivi pojavljivati u svim periodima mjerena. Utvrđeno je da bi trudnice trebalo prosvećivati o značaju i uticaju sporta i fizičke aktivnosti na zdravlje i blagostanje djeteta. Motivi unutar motivacione strukture se mogu mijenjati pod određenim okolnostima. Rezultati govore da se u trudnoći najčešće javljaju motivi radi zdravlja i pozitivnog uticaja na zaštitu nerođenog djeteta.

Kada govorimo o motivacijskim tokovima mislimo na one koje svaka ispitanica, bez obzira da li je ona toga svjesna ili ne, da li su joj poznati ili ne, vidi kao korisne u svom životu. Od stepena uspješnosti njihovog djelovanja zavisi stepen prilagođavanja životnim okolnostima. Dominacija jednog ili više motiva nad drugima je posljedica različitih životnih situacija i individualnog iskustva. Trudnoća kao stanje potpune fiziološke i psihološke promjene takođe djeluje i na promjenu motiva ispitanica.

Provedeno istraživanje govori upravo o tome. U vremenu prije trudnoće najčešće su se pojavljivali motivi: želim biti tjelesno sposobna, želim sačuvati svoje zdravlje, želim poboljšati svoje zdravlje i želim biti dobar uzor svojoj djeci. Manje izraženi motivi su: takmičenje, poslovni razlozi i naklonst in-

struktora. Od trenutka kada žena shvati da je trudna počinje da se prilagođava novom stanju i pored starih pojavljuju se i novi motivi koji ostaju relativno stabilni tokom trudnoće. Pored već pomenutih starih motiva pojavljuju se dva nova motiva koja smo nazvali zdravlje nerođenog djeteta i pozitivan uticaj majčinog dobrog raspoloženja na dijete. Motivi koji se prije trudnoće javljaju sa manjom učestalosti ostaju takvi i tokom trudnoće.

U trudnoće su se pojavili motivi za sportske aktivnosti koji su vezani za posebno stanje dvije osobe u jednom tijelu. Da su motivi značajni za zdravlje trudnice i djeteta izjasnilo se 81,6% ispitanika, a 84,0% smatra da dobro osjećanje majke ima pozitivan uticaj na zdravlje djeteta.

Trudnica stavlja u drugi plan svoja razmišljanje o budućnosti pošto je preokupirana brigom za trenutne i bliske događaje. Misli se, prije svega, o primarnoj materinjskoj preokupaciji. Ali to je ne odvlači od njenih ustaljenih potreba i potreba koje od nje

očekuju drugi. Na to možemo gledati ne kao posljedicu samoga stanja trudnoće, već takođe i kao na promjenu njenih starih navika koje su sada usmjerene na buduću brigu o djetetu. Zato je za očekivati da se već na formiranu motivacijsku strukturu, u tom period, formiraju novi motivi koji su usmjerni prema dobrom zdravlju majke, njenom dobrom psihičkom stanju i pozitivnom uticaju na razvoj djeteta.

Rezultati su pokazali da prevladavaju motivi koji su vezani za zdravlje i blagostanje majke, a napredovanjem trudnoće motivi su bili sve više usmjerni prema djetetu. Što su motivi za sportsku aktivnost izraženiji time je veća vjerovatnoća da će trudnica svoje želje i potrebe zadovoljiti u okviru zdravog načina života. Zato je važnost da je svaka trudnica svjesna značaja sportske aktivnosti i zdravog načina života kako bi time dobila višestruke pozitivne efekte, kako za seba tako i za razvoj njenog djeteta.

**Ključne riječi:** motivaciona struktura, sportske aktivnosti, trudnoća.

# CAN WE MAKE THE ALPINE SKI LEARNING MORE EFFICIENT BY OMITTING THE SNOW-PLough TECHNIQUE?

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## SUMMARY

The aim of our research was to define the most efficient 7-day alpine-ski learning program for the ski-beginners. The research included 126 alpine ski naïve students, randomized into two equally-sized groups, at the study start not differing according to morphological characteristics or motor abilities. Participants of one group were taught alpine skiing by parallel-carving technique exclusively, while the other group learned alpine skiing through traditional parallel and snow-plough techniques. Acquired ski knowledge was tested through demonstration of five ski technique elements, by five independent judges. Participants of the two groups differed significantly in the grades obtained for the elements short turn (2.85 vs. 2.44;  $p=.01$ ) and parallel turn (3.20 vs. 2.85;  $p=0.01$ ), where higher grades were achieved by the participants combining parallel and snow-plough techniques. To conclude, according to our observations, in the process of teaching alpine ski beginners how to ski it is more efficient to initially use both parallel and snow-plough alpine ski techniques.

**Key words:** alpine skiing, learning programs, teaching methods, ski-beginner.

## INTRODUCTION

Since the first use of skies as a means of transportation until now, many ski techniques emerged, and often new ones replaced those previously used. The main drive for ski technique evolution was the construction of skies, so not surprisingly carving skies have led to development of yet another, parallel-carving ski technique (Hirano & Tada, 1996; Johansson, et al., 2001; Müller, et al., 2005; Horterer, 2005). Additionally, ski technique utilization is dictated by the level of alpine ski knowledge (thus differing for recreational skiers and competitors) and also by the on-field snow conditions (Lešnik, 2002; Matković, et al., 2004; Supej, 2008.). Alpine ski schools are generally organized on a six or seven days based programs, during which alpine skiers

learn or improve their ski technique. The goal of all involved in the learning process (instructors as well as ski beginners) is to find the most efficient method of ski learning. Those learning want to absolve as much of alpine skiing and as fast as possible, while ski instructors want to transfer the greater amount of ski knowledge more efficiently. Due to enormous interest in alpine skiing, Takahashi & Yoneyama (2001) suggest the use of in-line skating in the preseason preparation period as they have proved skating to have a positive effect on alpine ski learning and also on improvement of movements needed during alpine skiing. Other model is based on changing the length of skies every few days during learning process. Learning starts on very short skies of 90 cm, followed by skies of 125 cm and finally ends on skies of varying length, selected

according to the morphological characteristics of the ski beginner. If the latter approach is selected, snow-plough technique is omitted (Murovec, 2006). To our knowledge there are no data in the published English literature which would suggest the better method of ski learning. Thus, the aim of our research was to give answer whether success of alpine ski learning depends upon the technique used, i.e. if the approach using parallel-carving ski technique can achieve better results than the approach based on combined parallel and snow-plough techniques. It emerged from the need to identify the most efficient method of teaching alpine ski beginners how to ski.

## METHOD

**Study population:** The research was conducted on 126 alpine ski naïve participants. Ninety six were male, and thirty of female sex. They were  $23.3 \pm 1.66$  years old, with youngest participant 21 and oldest 28 years old.

**Variables:** In order to determine motor abilities participants were tested on following tests: 4 meters lateral agility test, 93639 forward-backward agility test, squat jump, counter movement, standing long jump, 3 kg medicine throw test - lying overhead, foot plate tapping test, catting test, sit-ups in 60 seconds, static strength leg test – squat position, sit and reach, lateral tilts on left and right leg, front-back tilts with left and right leg, sprint time over 20 meters and hexagon. Tests were repeated three times, and the best result was selected as final, except in the static strength leg test – squat position, which was performed only once. Measured morphological characteristics included height, weight, percentage of body fat, and right femoral girth. They were measured according to the directions and regulations of International Biological Program (Mišigoj-Duraković et al., 2008).

**Study design:** Study participants were randomly assigned into two equally-sized groups, differing only in the method used for alpine ski learning. In order to identify the superior way of alpine ski learning, the prerequisite was to have the two homogenous groups, not differing significantly in morphological characteristics or motor abilities at the study begin-

ning. Learning process lasted seven days in the ski resort Sappada, Italy, in identical conditions according to altitude, slopes, equipment, number of participants pro group, hours of learning, repetition of ski elements and exercises. Participants of first, experimental group learned alpine skiing through methods and exercises of parallel-carving ski technique exclusively, and other, control group learned alpine skiing using parallel and snow-plough techniques. Program was based on four hours daily of alpine ski learning with appointed ski instructor according to previously determined protocol. In this study special attention was given to the selection of ski instructors and judges engaged in the grading process. Six instructors were teaching according to one, and six according to the other program. They were all experienced in alpine skiing and teaching. Five judges, also experts in alpine skiing, were chosen to grade the knowledge of alpine skiing according to the previously determined strict criteria. Each judge could give a single grade to a participant on each of the five chosen elements of ski technique. Grades ranged from one (unacceptable performance) to five (superb performance). At the end of seven days, all participants were joined into a single group, in order to ensure the identical grading conditions and to avoid possible bias. Chosen elements of alpine ski technique for the alpine ski knowledge assessment included traversing, uphill turn, basic turn, short turn and parallel turn. Testing (motor abilities and morphological characteristics as well as grading) was performed within three months.

**Statistical analysis:** Between the groups differences on each variable were tested by ANOVA. Existing differences were determined by Fischer test. Pearson coefficients ( $r$ ) were calculated between the grades given by each judge on the five chosen elements of ski technique. Factor analysis was used to define the metric characteristics. Number of important factors was determined by (Guttman-Kaiser) GK criterion. Differences between the motor abilities of participants of the two groups were tested by Mann-Whitney test. Bonferroni correction was used to minimize the alfa error. Results were considered significant with  $p < .01$ .

## RESULTS

At the study beginning differences between the participants of the two groups were determined and obtained results enable the assumptions whether the morphological characteristics and/or motor abilities contribute significantly to alpine ski learning process (Table 1). Results show non-significant differences between the groups in the morphological characteristics (Table 1).

According to ANOVA differences between the participants of the two groups in tested motor abilities were non-significant (Table 2). Neither participants of the control nor the participants of the experimental group had

advantages/disadvantages when motor abilities, such as agility, explosive strength, frequency, repetitive strength or flexibility were tested.

Distribution of results in the remaining tests for assessment of explosive strength of hands and shoulders, movement frequencies, repetitive strength and balance varied significantly from normal distribution, so for the statistical analysis of between the groups differences nonparametric Mann-Whitney test was used (Table 3). Significant differences were not found in the remaining of seven tests used for assessment of participants' motor abilities (Table 3).

TABLE 1.  
*Between the groups differences in morphological characteristics*

Variable	Control group		Experimental group		ANOVA	
	M	SD	M	SD	F	P
Height	175.42	9.67	176.88	8.04	.85	.36
Body Mass	74.62	12.48	76.68	12.54	.85	.36
% Fat	13.93	4.99	14.62	4.17	.71	.40
Femoral Girth	57.73	3.42	58.50	4.06	1.33	.25

TABLE 2.  
*Between the groups differences in motor abilities*

Test	Control group		Experimental group		ANOVA	
	M	SD	M	SD	F	p
MAGKUS	8.31	.69	8.19	.63	1.06	.31
MAG9NN	8.47	.65	8.44	.61	.09	.77
MESSJ	40.6	5.57	40.12	6.46	.20	.66
MESCM	42.7	6.12	42.91	6.77	.03	.85
MESSDM	226.49	21.06	227.44	22.19	.06	.81
MFRCAT	30.54	2.88	30.37	2.92	.10	.75
MRSPT6	57.12	7.53	58.00	7.6	.42	.52
MFLSAR	13.02	5.53	13.33	5.17	.10	.75
MES20M	3.48	.44	3.47	.28	.00	.95
MAGHEX	11.27	1.18	11.29	1.05	.01	.93

Legend: **MAGKUS** - 4 meters lateral agility test; **MAG9NN** - 93639 forward-backward agility test; **MESSJ** - squat jump; **MESCM** - counter movement jump; **MESSDM** - standing long jump test; **MFRCAT** - cating test; **MRSPT6** - sit up test; **MFLSAR** - sit and reach test; **MES20M** - sprint time over 20 meters; **MAGHEX** - Hexagon test

TABLE 3.

*Between the groups differences in motor abilities<sup>1</sup>*

Test	Control group		Experimental group		Mann-Whitney	
	M	SD	M	SD	Z	P
MESBML3	75.29	19.26	75.07	17.3	-.04	.97
MFRTAN	22.66	1.82	22.98	1.49	-1.08	.28
MSSIC	94.48	44.65	95.47	57.81	-.44	.66
MRU10L	25.45	21.00	27.1	27.7	-.30	.77
MRU10D	26.11	21.26	26.08	24.05	-.53	.60
MRP10L	7.42	5.59	6.71	5.99	-.82	.41
MRP10D	7.38	4.32	8.31	11.62	-1.08	.28

Legend: **MESBML3** - 3 kg medicine throw test - lying overhead; **MFRTAN** - foot plate tapping test; **MSSIC** - static strength leg test – squat position; **MRU10L** - lateral tilts on left leg; **MRU10D** - lateral tilts on right leg; **MRP10L** - front-back tilts with left leg; **MRP10D** - front-back tilts with right leg

TABLE 4.

*Correlation coefficients between the grades given by five judges for each element of alpine ski technique*

	traversing	uphill turn	basic turn	short turn	parallel turn
judge 1 & 2	.77**	.80**	.83**	.75**	.81**
judge 1 & 3	.76**	.80**	.77**	.80**	.80**
judge 1 & 4	.69**	.80**	.81**	.77**	.81**
judge 1 & 5	.72**	.81**	.78**	.72**	.83**
judge 2 & 3	.85**	.80**	.86**	.79**	.83**
judge 2 & 4	.85**	.83**	.91**	.79**	.84**
judge 2 & 5	.83**	.86**	.87**	.88**	.85**
judge 3 & 4	.77**	.86**	.87**	.82**	.83**
judge 3 & 5	.79**	.84**	.86**	.82**	.84**
judge 4 & 5	.75**	.84**	.83**	.78**	.83**

\* p<0.05; \*\* p<0.01

TABLE 5.

*Results of first components of judges during grading of participants on five elements of alpine ski technique*

Element of ski technique	Components (factors)	Eigenvalue	% variance
traversing	1	4.12	82.31
uphill turn	1	4.30	86.01
basic turn	1	4.35	87.06
short turn	1	4.17	83.38
parallel turn	1	4.31	86.23

<sup>1</sup> In Table 3, arithmetic means and standard deviations are given only to show the direction of orientation while Mann-Whitney is a nonparametric test.

TABLE 6.  
*Differences between the participants of the two groups in the knowledge of alpine skiing*

Element of ski technique	Control group		Experimental group		F	P
	M	SD	M	SD		
traversing	3.46	.72	3.27	.64	2.49	.12
uphill turn	3.24	.74	2.95	.71	5.02	.03
basic turn	2.98	.88	2.70	.75	3.43	.07
short turn	2.85	.83	2.44	.83	7.78	.01
parallel turn	3.20	.76	2.85	.77	6.83	.01

In order to determine judges' objectivity in grading new alpine ski knowledge correlation coefficients between the grades given to each participant on each element of alpine ski technique were calculated. Obtained correlation coefficients showed the accordance of judges in grading elements of alpine ski technique (Table 4), and high levels of correlation point to satisfactory objectivity of all five judges. It can be concluded that grades obtained for the demonstration of elements of alpine ski technique are a reflection of new knowledge and not influence of judges.

Homogeneity of judges was determined by factor analysis, and the results (Table 5) showed that all estimated the same item, i.e. alpine ski knowledge. Beside the presented first components, no other component was statistically significant according to GK (Guttman-Kaiser) criterion.

Results in Table 6 show the better method of learning alpine skiing. Variable that helped in differentiating the better approach was the grade each participant obtained for the demonstration of new knowledge of alpine skiing. Before the ANOVA, Bonferroni correction was used. As this research used five (dependent) variables, according to Bonferroni correction statistical significance was set at  $\leq 0.01$ . The two models of learning alpine skiing did not give significant differences in traversing, uphill turn and basic turn (Table 6). However, participants of the two groups differed significantly in the knowledge of short turn and parallel turn ( $p=0.01$ ). If arithmetic means of grades obtained in the mentioned elements of alpine ski technique are compared between the participants who learned alpine skiing by parallel and snow-plough technique with those

achieved by participants using parallel-carving ski technique (Table 6), then better results were achieved by the former group.

## DISCUSSION

As participants of the two groups did not differ significantly in motor abilities or morphological characteristics at the beginning of this investigation, it can be concluded that their achievement in alpine skiing is attributable to different models used in learning. So, higher grades obtained by the participants pertaining to group taught by elements of parallel and snow-plough techniques are a result of better learned basic ski movements. Participants of the more successful, control group adopted continuous semicircular leg movements much better, which helped them in the end to better demonstrate the new knowledge of alpine skiing, especially to join short turns and parallel turns. Placing modern skies on their side edges, due to constructional characteristics, makes a sharp and clear-cut mark in the snow and also enables marked increase in speed during turn performance. Obtained speed on skies can be controlled by mentioned continuous semicircular leg movements (Hirano, et al., 1996; Kaiser, 1997; Schiefermüller, et al., 2005), which were better acquired by participants with higher grades on short turn and parallel turn. Programs of learning alpine skiing which omitted snow-plough technique in the end proved to be inefficient and not advantageous. It seems that at the beginning of the learning process, elements of snow-plough technique help faster learning, and are not necessarily to be avoided. Moreover, they have the advantage in the basic alpine ski learning

school as they help the beginners to lower the center of gravity and additionally enlarge the area under the skies (Carr, 2004). Moreover, snow-plough technique also helps ski beginners in capturing good balance posture, which in addition to placement of skies on their inner edges, gives complete control of speed (Matković, et al., 2004). Of course, elements of snow-plough technique need not be forced at later stages, when participants of alpine ski school have mastered them, and advanced elements based on parallel ski techniques can be used. As a bridging phase, between snow-plough and parallel ski technique, many use so called wedge shaped ski posture, differing from snow-plough posture by the narrower width of back of the skies (Lešnik, et al., 2002). This posture used either as a methodic exercise or element of alpine ski technique, gradually helps to prepare the ski beginner to fully perform the turn by using solely parallel ski technique. Due to the mentioned, this specific ski technique is used during beginning phases of alpine ski learning. In our investigation, this technique was omitted in one examined group. One program was based exclusively on parallel-carving ski technique. From the early beginning, participants were taught to place skies on their edges, by using the constructional features of carving skies. This program would surely satisfy the demands of modern attendant of alpine ski school for speeding up the learning process, in order to maximize the use of free time during winter holidays. However, faster use of more demanding elements of parallel ski technique, in principle leads to skipping the indispensable phase of alpine ski learning. Desire to faster convey the knowledge of alpine skiing at the end impoverishes recreational alpine skiers for information and ski movements important during later, more advanced phases of learning. Results of this investigation could help alpine ski instructors, in their everyday practice with alpine ski beginners. Newer, modern ways of alpine ski learning need not give better results at the end of the learning process. Only tested novelties, either in alpine ski equipment, or tools used during learning process as well as ways of knowledge transfer are to be safely used in praxis. Important role in learning al-

pine skiing plays a model i.e. method of alpine ski learning, in addition to capacity and skill of ski beginner and ski surrounding (Lewandowski, 2006). Our investigation proved the importance of exercises and elements of snow-plough and parallel techniques of alpine skiing in achieving better results during beginning phases of alpine skiing.

## CONCLUSION

Young motorically capable alpine ski beginners learn alpine skiing better when initially taught by elements of parallel as well as snow-plough technique. Implementation of our results into everyday practice would contribute to greater interest of recreational skiers for this specific motor activity.

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# DA LI JE EFIKASNIJI NAČIN PODUČAVANJA ALPSKOGA SKIJANJA BEZ PRIMJENE PLUŽNE SKIJAŠKE TEHNIKE?

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Cilj istraživanja bio je definisati efikasniji sedmodnevni program podučavanja skijaških početnika alpskom skijanju. Istraživanje je sprovedeno na uzorku od 126 ispitanika koji prije samog istraživanja nikada nisu učili ili samostalno probali motoričku aktivnost alpsko skijanje. Prosječna dob ispitanika bila je  $23,3 \pm 1,66$  godina, a unutar uzorka najmlađi ispitanik imao je 21, a najstariji 28 godina. Uzorak je slučajnim odabirom bio podijeljen u dvije, veličinom jednake grupe. Na taj način formirane su dvije grupe ispitanika na kojima se je primijenio različiti tretman. Preduslov za istraživanje bio je da se ispitanici dviju grupa međusobno nisu statistički značajno razlikovali na početku procesa podučavanja s obzirom na morfološke karakteristike i motoričke sposobnosti. Zbog toga su svim ispitanicima bile utvrđene osnovne morfološke karakteristike te procijenjene motoričke sposobnosti. Proces učenja alpskoga skijanja za ispitanike dviju grupa proveden je u skijaškom centru Sappada (Italija). Ispitanici jedne grupe učili su osnove alpskoga skijanja pomoću metodičkih vježbi i elemenata isključivo paralelne-“carving” skijaške tehnike, dok su ispitanici druge grupe učili osnove alpskoga skijanja primjenom metodičkih vježbi i elemenata paralelne, ali i plužne tehnike alpskoga skijanja. Ispitanici su imali identične uslove s obzirom na: boravak na nadmorskoj visini (1250-2000 m), korišćenje skijaške opreme, korišćenje skijaških terena jednakog nagiba prilikom poučavanja određenog skijaškog elementa, broj ispitanika u grupi (10 ispitanika), broj sati učenja (28 sati) i uvježbavanja (12), broj ponavljanja elemenata skijaške tehnike (4-8), broj ponavljanja metodičkih vježbi (1-3). Od izrazite važnosti za istraživanje bio je odabir kvalitetnih učitelja alpskoga skijanja i ispitivača. Odabrano je pet ispitivača, skijaških eksperata s dugogodišnjim

iskustvom u procjenjivanju znanja alpskoga skijanja koji su nakon završenog procesa podučavanja procijenili stečeno znanje alpskoga skijanja kod svih ispitanika. Pet nezavisnih ocjenjivača dalo je ocjenu svakom ispitaniku za demonstraciju pet odabranih elemenata skijaške tehnike. Procjena usvojenog nivoa skijaških znanja kod ispitanika valorizovana je ocjenom od jedan do pet. Nakon provedenog procesa podučavanja, a prije ocjenjivanja demonstracije pojedinih elemenata skijaške tehnike ispitanici obje grupe bili su spojeni u jednu, zajedničku grupu te je procjena znanja bila učinjena u isto vrijeme i na istom mjestu za sve ispitanike. Za utvrđivanje nivoa stečenog skijaškog znanja odabранo je ovih pet elementa: spust koso, zavoj k briještu, osnovni zavoj, vijuganje te paralelni zavoj od briješta. Analiza rezultata istraživanja pokazala je statistički značajnu razliku u ostvarenim ocjenama između ispitanika dviju grupa kod elemenata skijaške tehnike vijuganje (2,85 vs. 2,44;  $p=0,01$ ) i paralelni zavoj od briješta (3,20 vs. 2,85;  $p=0,01$ ). Naime, ispitanici grupe koja je podučavana elementima i metodičkim vježbama plužne i paralelne skijaške tehnike ostvarili su prosječno više vrijednosti ocjena u odnosu na ispitanike koji su bili podučavani isključivo elementima i metodičkim vježbama paralelne skijaške tehnike. Ispitanici uspješnije, kontrolne grupe zbog programa po kojem su učili usvojili su kontinuirana polukružna kretanja u zglobovima donjih ekstremiteta na višem nivou, što im je na kraju omogućilo tehnički bolju demonstraciju paralelnih zavoja od briješta i vijuganja. Stoga, moguće je zaključiti kako se efikasnijim modelom učenja alpskoga skijanja pokazao onaj koji je koristio metodičke vježbe i elemente plužne tehnike alpskoga skijanja.

**Ključne riječi:** alpsko skijanje, usvajanje skijaških znanja, načini učenja, skijaški početnici.

# SOME METRIC CHARACTERISTICS OF TESTS TO ASSESS BALL SPEED DURING OVERARM THROW PERFORMANCE

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## SUMMARY

The aim of the study was to determine metric characteristics of the 2 tests for evaluation handball ball speed during over arm throw of handball ball. Research was conducted on a sample of 50 students of the Faculty of kinesiology, average age of 20.4 years. Beside measurements of body height and body weight, speed of ball flight after over arm throw from sitting position (distance 4 meters) was assessed with radar gun. The tests of over arm throw were performed with a blocked and a free hand which does not perform a throw. Results show satisfactory reliability, sensitivity and validity of all tests. The homogeneity of tests was not good considering that the positive trend of results was observed. This is a consequence of respondent adaptation to the technique of over arm throw performance. Factor analysis extracted a latent dimension that may be called a factor of the ball speed during overarm throw performance. Respondents achieved significantly better results in the test RS because of biomechanical freer movement. This also confirmed the pragmatic validity of the tests. The tests are best for use in sports like handball, water polo, tennis, volleyball, baseball or throwing disciplines in athletics because of the similarity of overarm performance and technical elements of the chosen sport. The advantages of tests are fast performance, easy execution and good metric characteristics and the defects poor homogeneity and necessity for a radar gun.

**Key words:** arm and shoulder, explosive power, metric characteristics, overarm throw, radar gun, assessment.

## INTRODUCTION AND OBJECTIVES

Explosive power is the motor ability whose importance is unquestionable in the creation of top athletic performance of many teams and individual sports (Van den Tillaar et al, 2004; Gorostiaga et al, 2005; Falvi et al, 2006; Cronin et al, 2005). Hence, it is important to find the reliable measuring instruments that will give the instructors of the training process the best feedback information about this ability (Cronin-Owen, 2004).

Scientists in the field of sport are looking for this ability in relation with its manifesta-

tion, but also on its topological region the needed force for the outcome is produced from (Van den Tillaar et al, 2004; Kotzamanidis et al, 2003). Tests to evaluate the explosive power while the ball is being thrown are presented in this study. Van den Tillaar (2004) pays great attention to the throwing velocity of the object especially in sports like baseball, volleyball, javelin, or water polo. Furtheron, he tests the impact of various training programs on the outcome of the above mentioned ability. It seems that different types of force may affect the throwing speed of the object. And so, Van den Tillaar (2004) establishes high correlation between maximal iso-

metric strength and throwing velocity of the ball, while Kotzamanidis et al. (2003) prove, by the help of the students of kinesiology, the impact of training with external straining of the upper extremities on the throwing velocity of the ball. Hoffman et al. (2009) have come to the similar conclusions. Their sample includes the university players of American football. They have proved the significant impact of the maximal strength of arms and shoulder muscles on two-hand medicine ball forward throw.

Different anthropometric characteristics that can exert influence on this type of motor performance are being studied together with the ways of improving the speed of the throwing velocity of the object. So, Izquierdo et al. (2002) consider that the difference in the explosive power with the athletes of different sports and disciplines can give us just a partial explanation by the structure and distribution of muscle fibers, muscle mechanics and training system. Mayhew et al. (1993) have proved the influence of power and of body weight on the way of throwing the ball from a seated position with the university players of American football.

In accordance with the previous observations this study tested the explosive power of arms and shoulder belt in one-arm throw of the handball ball. For the purposes of this research two simple tests were made, according to the authors, to give a good qualitative description of this ability. The aim of this study is to determine the measurement characteristics of the newly constructed tests.

## MATERIALS AND METHODS

The study was conducted on a sample of 50 first year students (age:  $20 \pm 4$  years) of the Faculty of Kinesiology, University of Split. The procedure was explained to the students. They all agreed to participate in testing voluntarily. All of them were of a good psycho-physical health. Body height (BH) of the students was measured by anthropometer, body weight (BW) by a digital scale. During the measuring time the subjects were barefooted. The ball velocity was measured by Speedster Radar Gun made by Bushnell. Handball ball no. 3

(weight 380 gr., volume 58 cm) was used in testing. Newly constructed tests will be presented in the following part of the paper.

PICTURE 1

*RP Test*



*RP - throw with the opposite hand on the floor -* the student is in a sitting position (with legs slightly apart, at the angle of  $45^\circ$ ) 4.5 m away from the target dimensions 50 # 50 cm (lower edge of the target was 75 cm above the ground). The target was placed on the safety net behind which a surveyor with a radar gun was. Each student performs 3 hits to the target, when the hand, not running the throw, is placed on the floor.

PICTURE 2

*RS Test*



*RS - throw from the opposite free hand* - the student is in a sitting position (with legs slightly apart, at the angle of 45°) 4.5 m away from the target dimensions 50 # 50 cm (lower edge of the target was 75 cm away from the ground). The target was placed on the safety net behind which a surveyor with a radar gun is. Each student performs 3 hits at the target, when the hand, not running the throw, is freely placed in front of the body enabling the student to involve rotating muscles of the trunk.

## RESULTS

### *Reliability*

Correlation matrix between the particles in all tests together with two indicators of reliability tests, inter-item correlations and Crombach alpha coefficients were analyzed for the purpose of determining the reliability. The

determine that the instrument has satisfactory reliability, and that the error in measuring has been reduced to minimum.

### *Homogeneity*

Table 4 presents the results of analysis of variance for each test with the calculated values F and with the significance level p. It is clear that statistically significant differences between the measured particles in all tests exist. This leads us to the unsatisfactory homogeneity of the measuring instruments. After examining the average values of the individual measured particles trend towards better results, due to inhomogeneous measuring instruments, is evident. This trend is the consequence of adjustments of the students to the technique of throwing. It is to expect that with every new attempt of throw will be ever more rational, and the object will fly faster (Sertić et al 2005; Foretić et al 2009).

TABLE 1.  
*Correlation between RP test particles*

VAR	RP1	RP2	RP3
RP1	1.000	<b>0.851</b>	<b>0.811</b>
RP2	<b>0.851</b>	1.000	<b>0.858</b>
RP3	<b>0.811</b>	<b>0.858</b>	1.000

TABLE 2.  
*Correlation between RS test particles*

VAR	RS1	RS2	RS3
RS1	1.000	<b>0.934</b>	<b>0.928</b>
RS2	<b>0.934</b>	1.000	<b>0.934</b>
RS3	<b>0.928</b>	<b>0.934</b>	1.000

TABLE 3.  
*Inter-item correlations and Crombach alpha coefficients of RP and RS tests*

VARIABLES	II r	Crombach alpha ( $\alpha$ )
RP	0.84	0.93
RS	0.93	0.97

results are presented in Tables 1, 2 and 3. Significant correlations between 3 measured particles in both tests, as well as the Crombach alpha coefficients high value indicate the good reliability. Out of these results we can deter-

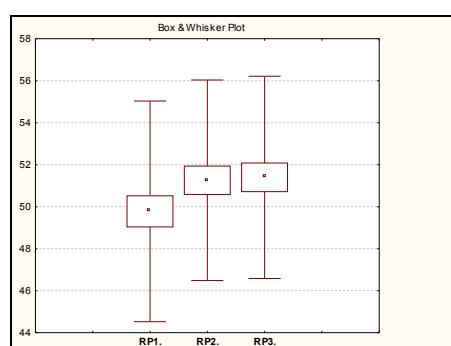
TABLE 4.  
*Analyses of variance for both tests*

VARIABLES	F	P
RP	10.07	<b>0.00</b>
RS	4.74	<b>0.01</b>

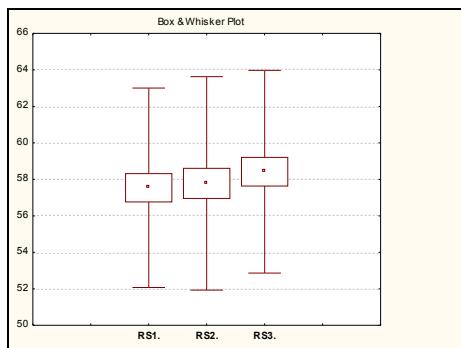
TABLE 5.  
*Mean results in each measurement particles*

VARIABLES	1. particle	2. particle	3. particle
RP	49.78	51.26	51.40
RS	57.54	57.78	58.42

DIAGRAM 1  
*Analyses of variance in Test RP*



**DIAGRAM 2**  
*Analyses of variance in Test RS*



### Sensitivity

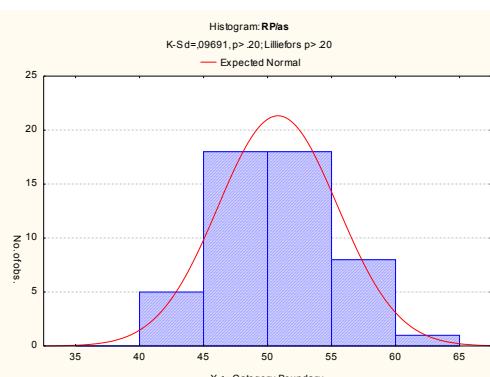
The results of measuring of 3 particles have been summed up by using the average arithmetic means to meet the needs of this study. The sensitivity of the tests is presented in Table 6. It is clear that there is no significant difference between obtained and theoretical normal distribution of the results. Because a single obtained K-S value of the test doesn't go beyond border line of it, hence we can assume that the measuring instruments do good distinction among the students and give satisfactory feedback to the criterion of sensitivity.

**TABLE 6.**  
*Descriptive statistics*

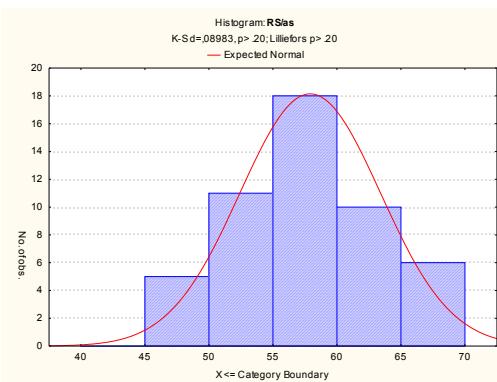
VAR	N	X±SD	MIN	MAX	KS test
RP	50	50.8±4.68	42.0	63.3	0.09
RS	50	57.9±5.50	47.0	69.7	0.08

The maximum theoretical value of KS test for N = 50 is 0.23 for p=0.01

**HISTOGRAM 1.**  
*Distribution of the results / RP*



**HISTOGRAM 2.**  
*Distribution of the results / RS*



### Factor validity

The results of factor analysis are presented in Table 7. Two measuring instruments have been included in the analysis. One latent dimension has been allocated from the 2nd manifested variable because, according to the author, it defines the explosive power of arms and shoulders. The factor variance is high, 1.88. The common factor projection of both tests shows that the tests measure the same motor dimension. Although authors think this is explosive power of arms and shoulders test should be compared with relevant number of instruments that measure mentioned dimension.

**TABLE 7.**  
*Factor analyses results*

VARIABLES	Factor
RP/as	<b>0.970439</b>
RS/as	<b>0.970439</b>
Expl.Var	1.883503
Prp.Totl	0.941752

Legend: **Factor** - significant factor in the Guttman-Kaiser criterion, **Expl.Var** - eigenvalue, **Prp.Totl** - amount of explained variance of all variables.

### Pragmatic validity

Pragmatic validity of a certain test shows how much, i.e., with what amount of certainty we can predict success in a practical activity based on the results of this test. It can be determined in many ways, and is directly related to the research aim that is being conducted. In

general, if the test has met the purpose, i.e., achieved, then the aim of the research has been reached and the pragmatic validity of the test has been proved (Dizdar, 2006). In the field of kinesiology researches are frequent trying to determine which test defines better the specific capability. Thus, this study also tries to determine whether there are differences between the tests that should assess the same motor ability - the explosive power of the upper extremities. Variance analysis has been made for this purpose. From the Table 8 the existence of statistically significant difference between these two tests is evident. After examining the results of descriptive statistics (Table 9) it is evident that the average values of the RS test are for 7.1 km/s higher than the values of the RP test. Literature reviews reveal that Foretić et al (2010) were engaged in the similar issues. They found out that by opening a kinetic chain by the sweep and the use of multiple muscle groups the students achieve greater force. If we analyze more carefully kinetic characteristics of the tests, it is obvious that the values of the RP test limit movement during the performance. In the previously mentioned test, only the forearm, upper arms, shoulders and chest muscles perform the throw. In comparison to this, in performing the RS test the movement is freer, and the trunk muscles, especially the rotational muscles, are included in performance together with the above mentioned muscles. This is why the students achieve better results in the RS test. Pragmatic validity of the tests has been confirmed because the use of the tests depends on the topological region that we want to test.

TABLE 8.  
*ANOVA between RS and RP tests*

VARIABLES	F	p
RP - RS	<b>48.42</b>	<b>0.00</b>

TABLE 9.  
*Descriptive statistical indicators*

VAR	N	AS±SD
TOTAL/as	100	54.36±6.20
RP/as	50	50.80±4.68
RS/as	50	57.90±5.50

## CONCLUSION

The blast is the manifestation of explosive power that is present in many sports and sport disciplines. Regardless of whether it is the ball throwing or any other apparatus, flight object speed always depends on the explosive force of one who deals with the object. Hence, it's very important to give to this motoric dimension the objective evaluation. The tests of evaluation should have qualitative metric characteristics so that the results could be properly used and analyzed. In this study two tests have been presented together with their metric characteristics.

All tests have shown relevant reliability. Homogeneity is not good enough because in every new particle in measuring a positive trend has been noted. It is probably due to the students' adaptation to the technique of throwing. The regular distribution points out that there isn't significant difference between obtained and theoretical normal distribution results. So, one can conclude that the measuring instruments differ the students rather well and are reliable. One latent dimension has been obtained by the factor analysis that, according to the author, can be named the factor of the ball speed during overarm throw performance. Pragmatically value has been tested by calculated variance analysis of the two tests. Due to biomechanical more free movement the students have shown statistically far better results performing RS tests. It has been confirmed that the tests are factory and pragmatically valid. Achieved data may serve to all the professionals who are interested in the speed of the flying object, its explosive force and its throw in general.

In general, the tests are the most qualitative to be applied in such sports as handball, water polo, tennis, volleyball, basketball, throwing disciplines in athletics because all of them have some similarities in performing the technical element of the chosen sport. The advantages of tests are speed and simplicity in performing together with good metrical characteristics, while the negative side is the bad homogeneity and the need for radar gun. At the end it's important to point out that in the further researches it would be good to compare similar tests from the different kinetically dynamic

(standing position, from the run, and from the jump). Furtheron, it would be necessary to examine up described phenomenon among the athletes of different disciplines and sports since this study has been done on the sample of Kinesiology Faculty students.

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# NEKE METRIJSKE KARAKTERISTIKE TESTOVA ZA PROCJENU BRZINE LETA LOPTE TOKOM JEDNORUČNOG IZBAČAJA

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Eksplozivna snaga motorička je sposobnost čija je važnost neosporna u kreiranju vrhunskog sportskog postignuća mnogih kolektivnih i individualnih sportova (Van den Tillar i sur, 2004; Gorostiaga i sur, 2005; Falvo i sur, 2006; Cronin i sur, 2005) pa je važno pronaći pouzdane mjerne instrumente koji će upravljačima trenažnog procesa dati najbolju povratnu informaciju o ovoj sposobnosti (Cronin-Owen, 2004). Shodno spomenutom, u radu se ispitivala brzina leta lopte prilikom jednoručnog izbačaja rukometne lopte. Za potrebe istraživanja konstrisana su 2 jednostavna testa koja bi prema mišljenjima autora mogli kvalitetno opisati ovu sposobnost. Cilj rada je utvrditi mjerne karakteristike novokonstruiranih testova. Istraživanje je provedeno na uzorku od 50 studenata, polaznika prve godine preddiplomskog studija Kineziološkog fakulteta u Splitu, prosječne dobi 20,4 godine. Izmjerene su osnovne antropometrijske karakteristike tjelesna visina i tjelesna težina kao i brzina udarca radarskim pištoljem Speedster Radar Gun, američkog proizvođača Bushnell. Za potrebe testiranja korištena je seniorska rukometna lopta. Testovi su se izvodili sa blokiranim rukom i slobodnom rukom koja ne izvodi izbačaj, iz sjeda, na udaljenosti 4 metra od radarskog pištolja. Zadovoljavajuća pouzdanost utvrđena

je značajnim korelacijama između 3 čestice mjerjenja kod oba testa kao i visokim vrijednostima Crombach alpha koeficijenata. Statički značajne razlike između čestica mjerjenja u svim testovima upućuju na nezadovoljavajuću homogenost mjernih instrumenata. Uvidom u prosječne vrijednosti rezultata pojedinih čestica mjerjenja vidljiv je trend ka boljim rezultatima što je karakteristika nehomogenih mjernih instrumenata. Trend je posljedica prilagođavanja ispitanika na tehniku izvođenja samog izbačaja. Obzirom da nema značajne razlike između dobijene i teorijske normalne distribucije rezultata te da niti jedna dobijena vrijednost K-S testa ne prelazi graničnu vrijednost zaključeno je da mjerni instrumenti dobro razlikuju ispitanike te zadovoljavaju kriterij osjetljivosti. Faktorskom analizom utvrđena je faktorska valjanost testa. Varijanca faktora je visoka i iznosi 1,88. Projekcija na zajednički faktor oba testa nam govori da testovi mijere istu motoričku dimenziju. Iako je pretpostavka autora da se u ovom slučaju radi o eksplozivnoj snazi ruku i ramenog pojasa trebalo bi test usporediti sa većim brojem provjerenih mjernih instrumenata koji mijere spomenutu dimenziju. Pragmatička valjanost testirana je izračunavanjem analize varijance dvaju testova koja je pokazala da postoji statistički značajna razlika između ova dva testa. Uvidom u re-

zultate deskriptivne statistike uočeno je da su prosječne vrijednosti rezultata testa RS za čak 7,1 km/s veće od rezultata testa RP. Zbog biomehanički slobodnijeg pokreta ispitanici su prilikom izvođenja testa RS postizali statistički značajno bolje rezultate. Testovi su faktorski i pragmatično valjani. Dobijeni podaci mogu poslužiti svim ekspertima kojih intrigira brzina leta objekta, eksplozivna snaga ili izbačaj generalno. Testovi su najkvalitetniji za primjenu u sportovima kao rukomet, vaterpolo, tenis, odbojka, bejzbol ili bacačke discipline u atletici

zbog sličnosti izvođenja tehničkom elementu izabranog sporta. Prednosti testova su brzina i jednostavnost izvođenja te dobre metrijske karakteristike dok je mana loša homogenost i potrebitost radar pištolja. U budućim istraživanjima bilo bi dobro upoređivati slične testove različite kinetičke dinamike (stojeći položaj, iz trka, iz skoka) kod sportista različitih disciplina i sportova obzirom da je ovaj rad izведен na uzorku studenata kinezioloskog fakulteta.

**Ključne riječi:** eksplozivna snaga, izbačaj, metrijske karakteristike, radar pištolj, ruke i rameni pojas, testovi.

# PERCEPTION OF SPORTS OBJECTS POSITION INSIDE EDUCATIONAL-PROFESSIONAL STATUS OF GRAMMAR SCHOOL STUDENTS

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## SUMMARY

Numerous researches have shown that the high school pupils, whose adolescence is coming to an end, are in a very delicate choice situation. The peculiarity of their personal status enables the environment to exert influence on them and if possible to model their attitudes towards personal interests, thus, in a way, guiding them. That is why, each research into this population which aims to further their development and model a better quality future, is welcome in any form, and that is why that population is the topic of this paper. Taking into consideration that in the contemporary world, there is a general tendency to increase the level of education and emphasize the importance of professionalism in all walks of life, and on the other hand, there is a tendency to amplify the construction of different facilities, the issue tackled in this paper is how to define the relation between the education-professional status and sports buildings in the grammar high school students population in order to recognize the dynamic relations of those variables so as to possibly offer some conclusions and consequently adequate suggestions and upbringing-education guidelines. To resolve the issue, we used a sample of 400 pupils from the first to the fourth grade of the grammar school, described with 8 variables describing the education and professional status and 3 variables describing the sports facilities. The data were collected via a survey (author: Danijela Bonancin). After the normalization, a classic canonical correlational analysis was performed so as to establish linear combinations between the two sets of variables. The results obtained indicate the existence of two out of the possible three canonical factors, that is, two ways of linking the sets whereby one of them is somewhat more prominent. The results show an obvious existence of conservatism, social egoism, perhaps even selfishness among the existing population. Since some other researches showed that girls of the same age and from the same area were inclined to learning and changing, and being aware of that, they have a more positive opinion, the results of this paper can be explained to some extent by the mode of thinking prevailing in the surveyed community where maybe the sons – the heirs are placed on the pedestal and perhaps glorified a bit too much. It is likely that male children are led by the system towards the goal without inciting them to fight for it on their own. That is why they do not want change, they do not want to study, and as a consequence of that, they want it all for themselves.

**Key words:** education, conservatism, egoism, sports objects, canonical analysis.

## INTRODUCTION

Today's world is „fast“ and relentless. We either cope and progress, or stagnate and risk

to disappear. To survive in such a world, and to get well in it, and particularly to progress in it, we first ought to know a lot. We must have useful information, we need to have it at the

right time and we need to know how to use them. The man therefore needs to learn. And the learning process has equally advanced, and they do not just need to go to school, even though it still remains to be the learning base, but today we can also surf the Internet, read scientific publications, attend conferences (in person or on-line), consult experts (in person or on-line) and so on. A contemporary man therefore has several options how to satisfy the big and unavoidable quest for knowledge. On the other hand, a contemporary man, knowing so much, also requires, regretfully, a bit more than running beside a river or swimming in the sea. Natural resources are no longer sufficient due to the very nature of the problem (Dionísio, 2008). People mostly live in towns and the nearby river is two to three hours drive away, and sea can sometimes only be dreamed about. People are happy if they live in the outskirts of the city so that the air that they breathe is not too polluted. What can a man do to activate the body? What are his needs? What does he want and demand? The general tendency to build different buildings clearly shows that the „business fathers“ have understood the needs of the contemporary man (Olson, 2010). They build new courts, new facilities for bodily activity and furnish them with different gadgets and top of the notch technology (Carrol et al., 2001; Marren, 2004) all of which stretch the man and burden him in all possible ways, enabling a contemporary person to perform numerous tasks simultaneously, for example, when a modern woman walks the conveyer belt while watching the favoring soap opera series at the same time, in parallel to making notes on the one side for the Saturday shopping and the weekly business agenda on the other. In order to be able to simultaneously walk (handle the machine) the belt, write notes and watch the soap opera, the woman needs to know a lot and has to be able to coordinate that knowledge so as to perform the tasks. Some previous researches showed that women became aware of that already in adolescence (Bonacin & Bonacin, 2010) and that they are able to do it too. That means that they are aware of the importance of knowledge and the need to involve multiple variables to accomplish their

objectives. The facilities, on the other hand, are traditionally oriented towards sportsmen (Ma et al., 2006) and consequently, to a large number of supporters-consumers or to renting, that is, profit (Turley & Shannon, 2000; Henderson et al., 2010). It is therefore interesting to see what men of that age think about education, professionalism at work and the sport facilities.

## SUBJECT, PROBLEM, OBJECTIVE

Numerous researches have shown that secondary school pupils, whose adolescence status is coming to an end are in a very delicate choice situation. They chose the way they dress, they chose the groups that will go out with, they chose the faculties that will enroll. In short, they chose the path to pursue and form attitudes about themselves and about the world around them and act accordingly. The peculiarity of their status enables the environment to exert influence on them, and, if possible, to model their attitudes for their own purposes and manipulates/disposes with them. That is why every research of that population that aims to develop them and model their better quality future, is welcome in any form, and that is why that population is the subject of this paper. Taking into consideration that in the contemporary world, there is a general tendency to increase the level of education and emphasize the importance of professionalism in all walks of life, and on the other hand, there is a tendency to enhance the construction of different facilities, the issue tackled in this paper is how to define their attitudes with regards to education, business professionalism and sports facilities in order to define the needed upbringing-education guidelines.

## WORK METHODS

To resolve the problem, we used a sample of 400 boys from the first to the fourth grade of a Grammar School in Herzegovina, described through 4 variables that related to educational and professional status (variables/indicators are listed in Table 1). The data were collected via a Likert type survey (au-

thor: Danijela Bonacin), whereby each claim was marked with 5 modalities, ranging from „I totally disagree“ to „I totally agree“. After the normalization of the data categories, a classical canonic correlational analysis was performed (Bonacin, 2010), so as to determine the linear combinations between the two sets of variables.

## RESULTS

The results showed the existence of two out of the three possible canonic factors, whereby the first one is somewhat more prominent than the other. That means that there are two ways of linking the educational/professional status and sport facilities,

where a part of the first and the second canonic factor is in the educational-professional area and one part is in sport facilities.

Linear combination of the first and second factor is described in the educational-professional area by the following categories: everyone needs education regardless of the age, gender or religion (-0.67); Professionalism guarantees success at work (-0.64), Professionalism has replaced emotions at work (-0.43), Learning is an important aspect of upbringing in the transfer of values of the society. (-0.41), Knowledge is used for the well-being of everyone (-0.36), Better education provides opportunity for better job. (-0.30), Most people are experts in their work (-0.10).

TABLE 1.

	Root	Root	Root 3
Level of education is less important today than before	0.04	<b>0.50</b>	
Everyone needs education, regardless of their age, gender or religion	<b>-0.67</b>	-0.34	
Learning is an important aspect of upbringing in the transfer of values of the society	-0.41	-0.41	
Better education provides opportunity for better job.	-0.30	<b>-0.58</b>	
Most people are experts in their work	-0.10	0.17	
Knowledge is used for the wellbeing of everyone	-0.36	0.34	
Professionalism has replaced emotions at work	-0.43	0.33	
Professionalism guarantees success at work	<b>-0.64</b>	0.12	
Variance extracted	0.18	0.14	
	Root	Root	Root 3
Facilities (playgrounds, swimming pools) are good for free time activities.	<b>-0.88</b>	<b>-0.45</b>	
New courts, halls and other facilities should be built	<b>-0.72</b>	0.31	
Facilities are overused by sportspeople, and others do not get anything	-0.32	<b>0.77</b>	
Variance extracted	0.46	0.30	
Can R	0.25	0.20	
Chi-sqr.	43.53	37.42	
df (for n=400)	24	14	
L.Prime	0.90	0.93	
P	<b>0.01</b>	<b>0.04</b>	<b>0.92</b>

The linear combination of the first factor is described in the area of sport facilities by the following indicators: facilities (playgrounds, swimming pools) are good for free time activities (-0.88), new courts, halls and other facilities should be built (-0.72), facilities are over-

used by sportspeople, and others do not get anything (-0.32).

As it can be seen from the results, the population thinks negatively: not everyone needs education, professionalism is not a guarantee for success at work and it has not replaced emotions at work. Learning is not an im-

portant aspect in the transfer of social values. Knowledge is not used for the wellbeing of everyone, better education does not provide opportunity for better job and most people are not experts of their work. There is an obvious resistance to change that unavoidably follows education which means that the whole population is conservative.

Further on, a belief prevails that facilities are not good for free time activities and new courts, halls and other facilities should not be built, because the facilities are anyhow overused by sportspeople and the others do not get anything. The population shows an obvious tendency towards lack of social education.

The linear combination in the second factor is described in the education/professional area by the following indicators: better education provides opportunity for better job (-0.58), the level of education is less important today than before (0.50), learning is an important aspect of upbringing in the transfer of social values (-0.41), everyone needs education regardless of age, gender, religion... (-0.34), knowledge is used for the wellbeing of everyone (0.34) professionalism has replaced emotions at work (0.33).

The linear combination in the second factor is described in the area of sport facilities by the following indicators: the facilities are overused by sportspeople, while the others do not get anything (0.77), facilities (playgrounds, swimming pools) are good for free time activities (-0.45), new courts, halls and other facilities should be built (0.31).

In psycho-social terms, the results show something that might be called egoism. The population believes that the level of education is less important now than it used to be and that it does not provide opportunity for a better job, even though they are aware that knowledge is used for general wellbeing. Further on, they believe that professionalism has replaced emotions at work which automatically implies that their personality has been lost – they themselves are not important, it is the job that matters. Likewise, they want new facilities to be built, but they believe that sports people overuse them – meaning, that they cannot use them. There is reason to be concerned due to the obvious conservatism and selfishness in

such a young generation because it is obvious that the solution and the ultimate fulfillment of all their possible objectives they see outside themselves, but also outside their active role in the social community, maybe in parents or some other similar support. They also probably see themselves as an objective, as it is obvious that they do mind to go through everything that is necessary to accomplish the objective, which is a colossal contradiction.

## DISCUSSION AND CONCLUSION

Throughout their secondary schooling the pupils of the grammar school go through an adolescence period which means that they undergo physical and psychological changes by the very fact that they are human beings (Đorđević, 1978). Dynamic changes that happen in the second grade of the secondary school (Bonacin & Bonacin, 2010) consist in the formation of own value systems and abandonment of previous ones by the arrival of new paradigms. Our children are no longer largely influenced by their parents, cousins, relatives and the environment as it was in primary school, and they gladly become self-assertive. But, the changes that happen during that period, in the second grade of the secondary school, or the consequences of those changes, obviously have a bigger impact on the female population of the same age, as the male population stays longer within the parental and other hubs. Apparently, women are faster in the genesis of their own value system (Bonacin & Boancin, 2010) while men obviously cherish an egoist innate attitude, in which they first take care of their own narrow and personal interest for which they are puberty reckless and insolent, selfish and socially stingy. This can be explained by the very fact that women have a more emotional nature and that they are naturally more open to others (because they are getting ready to raise their children) which makes them different to men, who only see themselves in everything and they guide themselves with reason when dealing with others.

On the other hand, the results can also be explained by social relations in those areas in which parents want to provide everything to

their children, particularly to boys, putting them thereby in a position in which they see themselves as an objective (which is not bad) but in the way that they do not participate in it enough. Boys see themselves in the FC Hajduk or FC Sarajevo or..., without realizing the importance of building new and modern, adjusted sport facilities in which they would train, the importance of accessories to train with, nor the time frame which needs to elapse before it is all built, and least of all the facilities as places for mutual kinesiology prosperity or no less important kinesiology recreation. Roughly speaking, they believe in the system of „connections“, they are conservative and do not want to changes, and consequently they do not want to learn. Maybe there should be a separate research to examine the general consequences of it the general value system by having such onset positions in life.

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# PERCEPCIJA POZICIJE SPORTSKIH OBJEKATA UNUTAR EDUKACIJSKO-PROFESIONALNOG STATUSA GIMNAZIJALACA

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Svrha - Mnoga istraživanja pokazala su da se učenici srednjih škola, koji svoj adolescentni status upravo privode kraj, nalaze u jako delikatnoj situaciji izbora. Delikatnost njihova ličnog statusa omogućava okolini da djeluje na njih, ako je moguće modelira njihove stavove u vlastite svrhe te na neki način raspolaže njima. Upravo zato, svako ispitivanje te populacije koje ima za cilj njihov razvoj i modeliranje kvalitetnije budućnosti, doborodošlo je u svakom obliku pa je zato ta populacija predmet ovog rada. S obzirom da se u današnjem svijetu sa svih strana nameće opšti trend povećanja stepena obrazovanja i naglašava važnost profesionalnosti u poslovnom svijetu a, s druge strane, postoji trend povećanja izgradnje različitih objekata, problem ovog rada je definisanje relacije edukacijsko-profesionalnog statusa i sportskih objekata kod gimnazijalaca. Svrha ovog istraživanja bila je utvrđivanje relacija profesionalnog statusa gimnazijalaca i njihove percepcije pozicije sportskih objekata.

Dizajn/Metodološki pristup – Identifikaciju problema socioloških fenomena, a naročito aktualiziranih paradigmi o sistemu vrijednosti lokalnih odnosa nemoguće je rješavati tek jednostranim metodološkim pretpostavkama, već je neophodno uključiti multidimenzionalne analitičke procedure. Za potrebe rješavanja problema ovog istraživanja korišćen je uzorak entiteta od 400 učenika od prvog do četvrtog razreda gimnazije opisan sa 8 varijabli koje opisuju edukacijski i profesionalni status i 3 varijable koje opisuju sportske objekte. Podaci

su prikupljeni anketom (autorica: Danijela Bonacin). Nakon normalizacije izvršena je klasična biortogonalna kanonička korelacijska analiza kako bi se utvrdile linearne kombinacije između dva skupa varijabli. Ova analiza jasno pokazuje multivarijantnu strukturu novih linearnih kombinacija, tj. skupa dimenzija koje egzistiraju u tretiranim subprostorima kao latentni fenomeni.

Rezultati - Rezultati su pokazali očigledno postojanje konzervativizma, socijalnog egoizma pa čak možda i sebičnosti kod ispitane populacije. S obzirom da je u nekim drugim istraživanjima pokazano da su djevojke istog godišta iz istog područja sklone učenju i promjenama pa, svjesne važnosti edukacije, pozitivno razmišljaju, rezultati ovog rada mogu se donekle objasniti načinom razmišljanja iz tretirane sredine gdje se možda sinove – nasljednike, stavlja na pijedestal i vjerojatno pretjerano glorificira. Vjerojatno mušku djecu sistem vidi na "cilju" bez da im se ponudi da se sami izbore za njega. Stoga oni ni ne žele promjene, ne žele učiti i kao posljedica toga žele sve za sebe. Ovakav rezultat, iako donekle neočekivan, dobro ilustruje današnje "ad hoc" modele ponašanja, koji ne uključuju sistematsko i postepeno usvajanje skupa socioloških i edukativnih vrijednosti.

Ograničenja – Iako je istraživanje jako pažljivo dizajnirano i provedeno, a i upotrebljene su analitičke procedure po najvišim naučnim standardima, ipak valja primjetiti da se rezultati ne mogu olako jednostrano ekstrapolirati u druge kulturološke ili zemljop-

isne sredine. Dakle, iako vjerojatno za tretiranu sredinu nije u pitanju jesu li rezultati vjerodostojni, svakako je potrebno izvršiti slična istraživanja u drugim sredinama, kako bi se kompetentno moglo zaključivati je li skup dobijenu saznanja imantan uzrastu i edukacijskom miljeu ili se radi o specifičnosti kraja u kojem je istraživanje provedeno.

**Praktične implikacije –** Moguće praktične vrijednosti istraživanja moguće je usmjeriti u dva načelna pravca. Prvi bi trebao predstavljati djelovanje na opšti sociološki kontekst s djelovanjem na skup egzistentnih parametara vrijednosnog sustava, za što je vjerojatno odgovoran cjelokupni hijerarhijski model definiranja trajnih vrijednosti socio-političkih zajednica, dok bi drugi mogao biti usmjeren na

nešto konkretniju edukaciju mladih još od najranijih dana, čime bi se ostvarila mogućnost operacionalizacije etičko-pedagoškog konteksta koji je i inače proklamiran.

**Vrijednost –** Vrijednost istraživanja treba promatrati prvenstveno na fonu identifikacije elemenata vrijednosnih opredjeljenja mladih koje se, u skladu s rezultatima, ponašaju kao paralelni sistem vrijednosti u velikoj mjeri nesukladan opšte prihvaćenim idejama o ciljanim rezultatima vaspitno-obrazovnih procesa svih relevantnih faktora socijalne zajednice. Isto tako, i ništa manje važno, punu pažnju bi trebalo usmjeriti prema edukaciji mladih u smislu razumijevanja važnosti i uloge značajnih resursa (objekti) i načina dispozicije tim resursima u odnosu na ciljeve zajednice.

**Ključne riječi:** edukacija, konzervativizam, egoizam, sportski objekti, kanonička analiza.

# OSGOOD SCHLATTER'S DISEASE IN YOUNG BASKETBALL PLAYERS

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## SUMMARY

In this work is presented the experience with Osgood Schlatters disease in young male basketball players. From one overall number of 257 young male basketball players with ages between 10 and 16 years is found that 23 or 8.9% had Osgood Schlatters disease. In control group of 250 young males (10-16 years) without sport activities is found 4 % of Osgood Schlatters disease.

All patients were treated with rest of training and sports activities and after that with physiotherapy. After 6 months everybody were allowed to have a full practice without clinical and radiological signs of disease.

Stronger physical activities in an early adolescent's period are one of main factors of appearing of Osgood Schlatters disease.

**Key words:** Osgood Schlater disease, basketball players, practice.

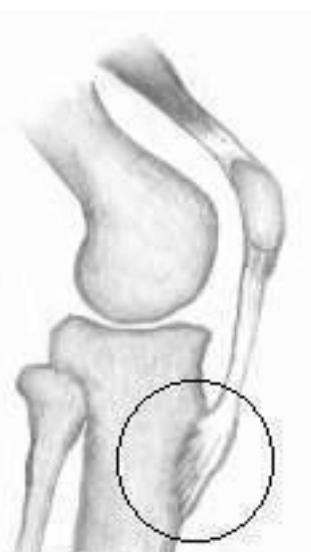
## INTRODUCTION

Disease Osgood-Schlatter represents apophysitis of proximal corner of a shinbone (lat. Tibia) or avascular necrosis, which occurs in a time of adolescence, respectively in a time of pronounced growth (Picture 1). It is characterized with appearance of pain inside of tibial protuberance (lat. Tuberositas tibiae) and probably represents inflammation of the glass of tendon and belonging cartilage plate growth tibia protuberance, and it is caused by physical activity, regarding traction. The magnetic resonance studies showed that in most cases, it is tendinitis of the glass of tendon, and in fewer cases, it comes to fragmentation of the bony part of the attachment of ligaments. It is observed that it frequently appears joined with "patella alta" syndrome. First time this illness is described in 1903 separately by American surgeon Robert Osgood and Swiss

surgeon Carl Schlatter, and by them, it got a name. (Nowinski & Mehlman, 1998)

## PICTURE 1

*Schematic view of the place appearing an OS illness*



Usually it appears at the age of 10 to 15 years, and etiologic factors can be hormonal, mechanical, inflammatory, and hereditary, mainly in children who deal with sports 20% in a difference with others who do not deal with sports where frequency is 4%. At boys, it occurs mainly in a period from 14 to 15 years, and at girls, it occurs earlier from 10 to 11 years. (Kujala, Kvist & Heinonen, 1985)

Both knees are affected in nearly 25% of the cases. (Gholve, Scher, Khakharia, Widmann & Green, 2007)

**PICTURE 2**  
*X-ray characteristic of the OS disease*



Detailed and correct anamnesis is very important (living conditions, diseases before, family anamnesis, does patient play sports and which, etc.). Next step is approaching to clinical examination. At first, doctor should exclude a possibility of existence of any other injury and/or disease in side of proximal cor-

ner of a shinbone and knee. Characteristic sign is a painful sensitive bulge on a top side of a shinbone. (Picture 2) It is necessary to test does the pain increase during straining for headed muscle of upper leg or during jumping only on a leg on which is a painful bulge. If stated tests are positive, there is a big possibility that is an Osgood – Schalatter disease.

Of imaging (RTG) techniques, mainly, it is used native radiography, and with a cause to reject a possibility of existence of the bony tumors and fractures of a bone.

People who have an Osgood-Schlatter disease, they have a characteristic profile X-ray image of a knee. (Picture 3) On it is seeable a bulge of attachment of tendon glass on shinbone, with irregular fragmented bone core (fragmented ossification), and swelling of the soft tissues. In some cases, ultrasound scan can be done, but it cannot replace X-ray images, even it gives better information about look of the tendon glass and its attachment. A magnetic resonance (MR) and a computed tomography (CT) are rarely used for diagnose of an Osgood–Schlatter disease. (Yashar, Loder & Hensinger, 1995)

**PICTURE 3**  
*A place of the most intensive pain in the side of a tibia bulge*



When establishing diagnose it is important to introduce a patient about natural course and prognosis of Osgood–Schlatter disease.

In curing process are used medications against pain, relief by splints and orthotics, and doing any sports activity is not recommended. (Cassas & Cassettari-Wayhs, 2006)

Despite applied therapeutic measures, symptoms (pain) could last for a different period of time, and as a rule, they totally disappear by end of a bone growth.

At the smaller number of patients (to 5.0 %), complaints persist also after a bone growth and after a bone maturity. (Engel & Windhager, 1987)

With those patients, there is a free bone fragment, or inside of a patellar tendon or inside insertions to the bone, and that fragment causes strong pain. At that time, it is identified surgeon treatment, what follows, removing of that free fragment. (Strickland, Coleman, Brunswic & Kocken, 2009; Canale & Beaty, 2008)

The purpose of a work was to establish an incidence of causing an Osgood-Schlatter disease at adolescents basketball players in organized sport club and compare to an incidence of Osgood-Schlatter disease at adolescents who are not involved in organized sport clubs.

## METHODS

In this work is tracked a group of young male basketball players from organized sport club in a period from January 2008 to June 2009 (in a further text group 1) and control male group, the same age, who were not involved in any sports activities.

In a group of young basketball players were tracked 257 boys, average age from  $12.8 \pm 3.2$  years, and in a control group there were 250 boys, average age from  $13.1 \pm 3.1$  years.

Average body height of examinees in a group 1 was  $162 \pm 40$  cm, and in a second group average height was  $155 \pm 45$  cm.

Average body weight at subjects in the first group was  $58 \pm 25$  kg, and in the second group average weight was  $56 \text{kg} \pm 25$  kg.

Duration of basketball practice in the first group was  $3.2 \pm 1$  year.

Average number of practices (with played games) in the first group, in a summertime period, was  $8 \pm 2$  on a hard pad (asphalt) and  $6 \pm 2$  in a winter period on parquet.

With all subjects, in both groups the anamnesis and clinic orthopedic examination was done, the positive findings (pain after moving,

limited moving and pain caused by a pressure on a tibia bulge), were transferred to a radiotherapy (RTG images in a standard projections).

With setting a diagnose to all patients from this group, it is suggested stillness for six weeks with spear of practice and all other sport activities, even riding a bicycle. Two patients from the first group were suggested wearing an orthotics for knee.

After a first phase of stillness, which lasted from six weeks to three months, patients were indicated to a physical therapy lasting from fourteen to forty-two days.

Specific way of practice was beginning from six weeks to six months after finding this disease.

Results of the research were processed using methods of descriptive statistics. During the processing measures of central tendency of obtained data and arithmetic environment with expression of result in percentages were used.

## RESULTS

In a group of boys who are dealing with sports activity (basketball), from total number of 257 we had 23 or 8.9% boys who had Osgood-Schlatter disease. In a control group from total of 250, 10 boys (4.0%) had Osgood-Schlatter disease. (Table 1 and Diagram 1)

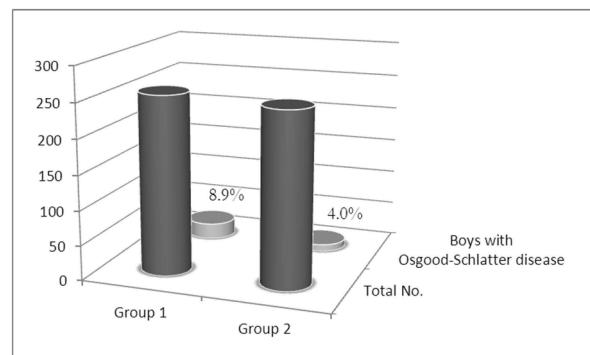
TABLE 1.  
*Total number of OS disease  
compared to a number of examinees*

	1	2	%
Group 1	257	23	8.9
Group 2	250	10	4.0

Legend: **Group 1** – boys who are dealing with sports activity (basketball), **Group 2** – control group, 1 – total number of boys, 2 – boys who had Osgood-Schlatter disease.

Average age in a group 1 was 13.2 years, and in a control group 12.9 years.

**DIAGRAM 1.**  
*Total number of OS disease  
 compared to a number of examinees*



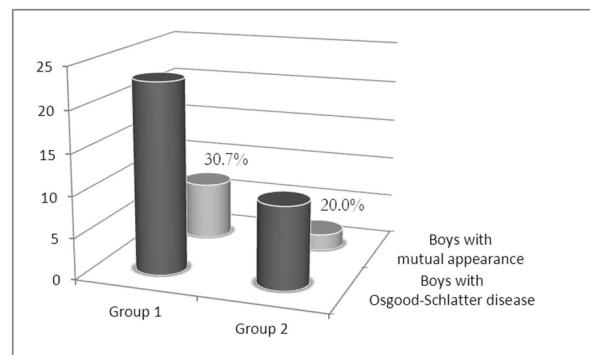
Mutual, Osgood–Schlatter disease appeared in the first group with 7 boys (30.4%) and in a control group with 2 boys (20.0%). (Table 2 and Diagram 2)

**TABLE 2.**  
*Mutual appearance of OS disease*

	1	2	%
Group 1	23	7	30.7
Group 2	10	2	20.0

Legend: **Group 1** – boys who are dealing with sports activity (basketball), **Group 2** – control group, **1** – boys who had Osgood–Schlatter disease, **2** – boys who had mutual appearance.

**DIAGRAM 2.**  
*Mutual appearance of OS illness*



A way of curing was identical in both groups (stillness, analgesics, physical therapy).

Return to specific sport practice was allowed when there was no subjective feeling of pain and when all moves in a knee were painless.

A fully return to specific practice for six patients (26.0%) was after six weeks, for ten patients (43.0%) the return was possible after three months, yet for four patients (18.0%) sports activities were enabled after four months. For three patients (13.0%) the return to sports activities was possible after six months. (Table 3 and Diagram 3)

In both groups with an Osgood–Schlatter disease, a longest period of recovery was equal.

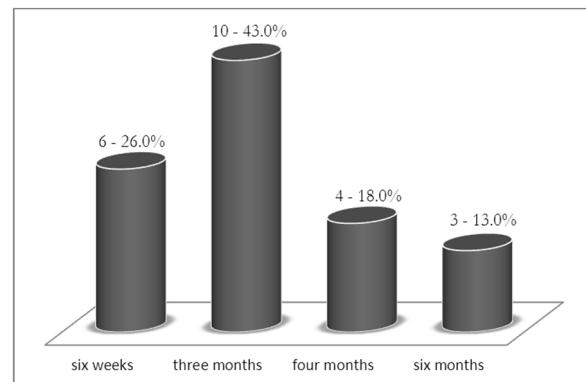
In a control group the return to school physical activity and to action of riding a bicycle was allowed after approximately three months.

**TABLE 3.**  
*Period of inability for doing sport activity – Group 1*

	1	2	3	4
Group 1	26.0%	43.0%	18.0%	13.0%

Legend: **1** – a fully return to specific practice after six weeks, **2** – a fully return to specific practice after three months, **3** – a fully return to specific practice after four months, **2** – a fully return to specific practice after six months.

**DIAGRAM 3.**  
*Period of inability for doing sport activity – Group 1*



## DISCUSSION

Sport has an important role in every area of human life. Physical activity influences positively on a healthy way of life, improvement of a health, and on quality of a life. One of main factors for healthy life is regular physical activity. It is impossible to count all positive aspects of physical activity, but without a doubt, some of them are: improvement of a

health and quality of life, long lasting life and less risk for certain diseases, like heart and blood drain diseases, diabetes, malignant diseases, etc.

Beside all positive features of sports, regarding, certain sports activity, especially if they are done not respecting the age and gender of sportsman, could lead to appearance of certain diseases. One of them, which can appear because of hard sports activities, is sournly apofizitis of tibia bulge (Osgood-Schlatter).

Repeated and hard straining of patellar tendon on attachment on tibia bulge is a cause of mechanical trauma, which causes a change of phatoanatomic shape of tibia bulge that in a certain moment can transform in "inflammable" – non infected faze when pain appears.

One of the factors that enhance the appearance of this disease surly is an inadequate practice of young sportsman, which is consisting of greater and frequent practice with intensity that is not justified with biomechanical characteristics of bones-joint system in children and adolescents.

Frequency of Osgood-Schlatter disease at young sportsman (basketball players) in our work is 8.9% which is a little bit less from Finland author studies who found that 13.0% of Finland teenagers have a sings of this disease (Visuri et al, 2007) (Visuri, Pihlajamäki, Mattila, & Kiuru, 2007), yet Brazilian authors showed prevalence of this disease in the same age group of Brazilian children from 9.8%. (Gildasio, Gomes dos Santos & Guerra, 2010)

However, beside a simple and easy discovery of this disease, at the biggest number of patients it occurs very late, almost in a phase of fragmentation – dividing of a tibia bulge when is required a long period of healing.

Reasons for late reporting of patients to a doctor are multiple, and the most common are that adolescents do not report pain that occurs from time to time because they can tolerate it very good, or because of a fear from going to a doctor, or a fear of a grant from practice. Mainly patients are reporting when parents notice that they have difficulties to walk, often they grab themselves for a knee, they complain about pain in an upper leg and similar. Than after determination of existence of this disease children and adolescents have difficulties to

accept a way of healing which strongly restricts any harder physical activities like physical education, practice, riding a bicycle, and similar, and the some number of patients, hiding, do some stated physical activities and they prolong a return to physical activities to themselves.

Negligence of symptoms of this disease with inadequate healing and sooner return to a leg working process, could lead to impossibility of returning to a specific sport practice at all.

Reinforced physical effort of children and adolescents are not excluded cause of formation of this disease, which is proven in this work, where we showed that at children and adolescents who are not exposed to reinforced physical effort also comes to appearing of this disease, but in less percentage.

Prevention of Osgood-Schlatter disease includes exclusion of activity which leads to it. It is known that chronicle, repeated stress on a tendon of patella and its attachment on a tibia bulge cause this disease. Possible ways of prevention includes, beside else, adequate period of worm-up before competition activity or practice, which has for a cause a preparation of muscles and tendons for activity and increases their flexibility and resistance on well programed sports activity adjusted to a biochemical abilities of competitor, strengthening the quadriceps which leads to reducing a stress of patella tendon, and at the end establishment of a balance between the power of the front muscle (m. quadriceps) and rare (mm. hamstrings) group of upper leg is a very important for preventing reinforced stress of patellar tendon.

## CONCLUSION

Reinforced sport activities in adolescent period are one of reasons for frequent appearance of apofizitis of tibia bulge, known under a Latin name Osgood-Schlatter disease. Inadequate legwork process by intensity and frequency surly plays a big role in a formation of this disease.

Knowing anatomic and biomechanical details of knee of the sportsman, which are in a phase of fast biological growth (adolescence)

and with a right programming and periodization of practice, and all with an individual biological maturity of sportsman and his physical fitness, Osgood-Schlatter disease is possible to prevent.

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# OSGOOD SCHLATTEROVО OBOLJENJE KOD MLADIХ KOŠARKAŠА

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Veliki broj djece i adolescenata uključen je u organizovane sportske aktivnosti te je broj pojave oboljenja tzv. sindroma prenaprezanja (engl. Overuse syndrom) sve veći. Sindromi prenaprezanja jesu oštećenja tetiva ili njihovih pripoja za kost do kojih dolazi zbrajanjem mnogih tzv. mikrotrauma. Sindromi prenaprezanja javljaju se i kod odraslih sportista i rekreativaca, ali imaju drugačije osobine. Djeca i adolescenti nisu samo "mali ljudi" jer se djeca u fazi ubrzanog rasta razlikuju od odraslih prema strukturama koje omogućavaju rast i razvoj, a to su ploče rasta, epifize i apofize i na tim osjetljivim hrskavičavim strukturama najčešće se pojavljuju sindromi prenaprezanja. Sposobnost djece da podnose dugotrajna opterećenja manja je nego kod odraslih. Kod djece za razliku od odraslih postoji na hvalištu tetive hrskavica koja je najčešće zahvaćena, pa govorimo o apofizitisu koji je jedna od najčešćih formi sindroma prenaprezanja kod djece sportista.

Ovo oboljenje ili sindrom može se naći i pod imenom juvenilne osteohondroze ili juvenilne osteonekroze, ali je suština poremećaj osifikacije apofize. Apofizitisi se mogu javiti na velikom broju kostiju u organizmu. Najčešće apofizitisi se javljaju u području golenjačne krvre (tibijalni tuberkul) i poznat je pod imenom Osgood Schletter (Ozgud Slater), zatim na glavi butne kosti – Legg – Calve – Perthes (Leg Kalve Pertes), na petnoj kosti Sever-ovo oboljenje...

Danas se sve veliki broj djece i adolescenata uključuje u sportske aktivnosti tako nije rijetkost da djeca i adolescenti provode na dan i po nekoliko sati na treningu. Opisani su slučajevi

maratonaca šestogodinjaka i djece koja su u bazenu plivala do 20 kilometara na dan te malih gimnastičarki koje su trenirale i po 6 sati na dan (Pećina, Bojanić & Hašpl, 2001). Sindromi prenaprezanja najčešće se javljaju u najmasovnijim sportovima fudbalu i košarci.

Rast i razvoj djece posebno u doba puberteta posebno je vulnerabilno razdoblje za povređivanje, odnosno za nastanak sindroma prenaprezanja. Nije rijetkost da u pubertetu dječaci i djevojčice izrastu 10 i više centimetara u godinu dana. Rast mišića i tetiva ne prati u potpunosti brzinu rasta kostiju, te se najveći pritisak javlja na hrskavici apofize koja je biomehanički najslabija.

Osgood Schlatterovo oboljenje ili apofizitis tibijalne krvre kao jedna od najčešćih juvenilnih osteohondroza, odnosno apofizitisa najčešće se javlja kod košarkaša.

Kao i u drugim bolestima u medicini i kod sindroma prenaprezanja važna je prevencija. Međutim moramo znati da je otpornost dječijeg organizma na dugotrajna i ekstremna opterećenja manja nego kod odraslih odraslih osoba. Jedan od osnovnih preduslova prevencije sindroma prenaprezanja lokomotornog sistema kod djece i adolescenata sportista je bolja edukacija sportskih radnika, posebno trenera. Pogrešno je mišljenje da su djeca fleksibilnija od odraslih i da ne trebaju vježbe istezanja kao uvod u trening. Važna je i sekundarna prevencija. Treneri moraju biti edukovani o simptomima sindroma prenaprezanja i kod pojave početnih simptoma djecu i adolescente treba poslati ortopedu jer je na vrijeme preduzeto liječenje je jednostavnije i kraće. (Pećina, Bojanić & Hašpl, 2001)

**Ključne riječi:** Osgood Schlater oboljenje, košarkaši, trening.

# GUIDELINES FOR AUTHORS

## JOURNAL INTENTION

**Sport Logia** journal covers the areas of sports and physical education. It is issued twice a year and publishes original scientific papers, reviewed scientific papers, scientific gathering presentations, short scientific articles and professional articles from the area of sports, physical education, recreation, kinesiology anthropology, training methods, sport biology and exercise, sport medicine, biomechanics, sport history and sport management as well as contributions from other sciences (medicine, sociology, psychology, philosophy, exact sciences and mathematics) applied in sports.

## GENERAL REMARKS ON PAPERS

All manuscripts are submitted to the journal's editors, who, after reading the manuscripts, decide about the further procedure: (1) the manuscript is immediately sent for review; (2) if there are any objections and suggestions, the manuscript is sent back to the author for corrections; (3) rejection of the manuscript. The editor may decline the manuscript in the following cases: (1) the topic of the manuscript is not relevant; (2) a manuscript with a similar topic has already been published in the journal; (3) the manuscript does not conform to the standards of the journal. If the manuscript is not accepted, a short notice is sent to the author, but the manuscript is not sent back.

If the author has corrected the text in accordance with the instructions from the editor, the manuscript is sent for review. In that case, the author will be given a form called Copyrights Declaration, which needs to be filled in and sent back to the editor. The signature of the author verifies the authenticity of

the text, authorship and acceptance of the review procedure.

All articles must be reviewed. There shall be two reviewers from the relevant scientific area for each article, and both reviews shall be anonymous. The author's name shall be unknown to the reviewers (double blind review). If a reviewer finds the article noncompliant with the criteria of the journal, the editorial shall not accept the article. If, on the other hand, the reviewers find the article acceptable, it will be put in one of the following categories:

**Original scientific paper** is a first publication of original research results in a form that the research can be repeated, and the asserted facts verified. It is organized in accordance with the IMRAD scheme for experimental research or in a descriptive way for descriptive science areas.

**Scientific work review** is a review of papers on a specific topic, works of an individual researcher or a group of researchers whose aim is to summarize, analyze, evaluate or synthesize already published information. It brings new syntheses which also include results of author's own research.

**Short scientific article** is an original scientific article which may skip some elements of IMRAD. It concisely presents results of a completed own research or of an ongoing research.

**Scientific gathering presentation** is a comprehensive article that has previously been briefed to a scientific gathering, but it has not been published in its comprehensive form in the Paper Collection Book of the gathering.

**Professional article** is a review of something that is already known, with an emphasis on the usability of the results of the original research and the spread of knowledge. The complexity of the text is adjusted to the needs of the professional and scientific aspects of the journal.

After reviews have been done, the editorial board will analyze them. If needed, the paper is sent back to the author who must comply with the suggestions and objections made by the reviewers. Once they have redone the paper, the authors need to specifically describe, **on a separate sheet of paper**, how they have resolved the reviewer's suggestions.

**Only those papers that have been placed in one of the categories and which have two positive reviews will be published.**

## TEXT STYLE AND ORGANIZATION

Scientific articles must adhere to the IMRAD scheme (Introduction, Methods, Results and Discussion).

### Title

The title page of the manuscript should contain the following information: (1) a concise, but informative title. Use of abbreviations is not encouraged; (2) the author's names (do not include degrees); the last one is introduced by "and"; (3) the affiliation of the authors, town and state; (4) the name and address of the corresponding author (must include title, degree and position of the corresponding author, phone and fax numbers – zip code for the country and city, and email address).

### Short and large abstracts and key words.

The short abstract should be brief and self-explanatory, written in English, and without reference to the text of the manuscript. It should cover a general presentation of the topic (the purpose and the objective of the paper), results and conclusions. Authors should not use abbreviations. The abstract should include 150-250 words.

Three to six words, which are not part of the title, need to be singled out. The Key words need to reflect the contents of the paper.

Large abstract should not exceed 1800 characters (up to three pages of double spaced

text) and should be written in Serbian language.

### Introduction

This part of the paper ought to inform the reader of the issues dealt with in the research and the results of previous analyses. The purpose of the research should also be clearly stated in this part.

### Methods

This part should consist of the following subtitles: entity sample, variables, procedures, tastings, statistical analysis.

Units of measurement, symbols and abbreviations must conform to international standards. Measurements of length, height, weight and volume should be given in metric units (meter, kilogram, liter).

### Results

The results should be reported as tables, graphs and pictures, possibly processed statistically and be concisely presented in the text.

Tables, graphs and pictures showing the results of individual analyses need to be indicated in the text for easier reader navigation.

### Discussion

The authors are expected here to comment on the results and compare them with literature data. The discussion must be professional and correspond to experimental data. Practical implications are welcome.

### Conclusion

Contains clearly stated scientific assertions, open issues and recommendations for further research.

### Tables, graphs and pictures

Each table and any illustration (black and white only) must be submitted on a separate sheet of paper. Tables should be numbered in the order in which they occur in the text and referred to as "Table 1.", for example. Each table should be accompanied by a short title. Tables should be accompanied with

interpretations (legends). It will also be deemed informative if the tables include indications of important correlations and relevant variables.

Illustrations, graphs and pictures shall be marked as „Figure 1“. Photographs are sent in electronic form in a resolution not smaller than 300 dpi and in a jpeg format. Each figure needs to have a short title. In case that the figures are taken over from another paper, the title should not include the original name. In such a case, the source where the picture was taken from should be indicated under the picture. If tables, graphs and pictures contain special symbols, or are prepared in a special program, they must be submitted in a separate file, with clearly indicated order of their inclusion in the text.

## ARTICLE TECHNICAL FORM

Articles are written and published in Latin alphabet, and, when needed, in other alphabets, in the Serbian language (ijekavica dialect) and the English language. Any deviation from this, needs to be agreed with the editorial board in advance.

Texts are to be written in Microsoft Word Windows program, on A4 paper format. Text is to be written in the Times New Roman font, size 12 pt in 1.5 spacing, aligned on both sides, with a 1 tab denting of the first row of a paragraph, with 2.5 cm paper margins. If it is necessary to indicate a word or a sentence in the text, use the italic. Text size should conform to 15 pages. The editorial board may accept a bit longer papers, but it will seldom do so.

Articles and abstracts should be written in the third person, neutrally, adhering to a good style and defined linguistic norms.

## REFERENCES

The journal uses the Harvard reference system – APA standards for referencing literature.

### Reference citations in text

The first and foremost rule where the APA standard is strict and clear is that the referenced literature must not include those titles that have not been referred to in the text. Rather, own literature should only be enriched by relevant research which have truly been read and applied as part of the set thesis.

If the results or something else from the work of one author are referred to, the name and the surname of the author should be stated, as well as the publication year in brackets:

Cormack (1994) states that „when writing for a professional readership, writers invariably make reference to already published works“, or

Making reference to published work appears to be characteristic of writing for a professional audience (Cormack, 1994).

When there are two authors in the same paper, they should both be stated with the use of the sign „&“:

White & Brown (1964) in their recent research paper found..., or

During the mid nineties research undertaken in Luton (Slater & Jones, 1996) showed that...

When there are more than two authors in the paper, only state the name of the first one and add „et al.“:

Green, et al. (1995) found that the majority ..., or

Recent research has found that the majority of... (Green, et al., 1995)

If the date is unknown, use the „n.d.“ mark:

Smith (n.d.) has written and demonstrated..., or

Earlier research (Smith, n.d.) demonstrated that...

If there are several works of one author in several years:

as suggested by Bloggs (1992, 1994), or

(Bloggs 1992, 1994)...

If there are several works of one author in the same year:

Earlier research by Smith (1993a) found that... but later research suggested again by Smith (1993b) that..., or

Bloggs (1993a, b) has stated on more than one occasion that...

If a text does not have an author, put „

Anon.“: Marketing strategy (Anon., 1999)

**If it is a secondary source:**

Research recently carried out by Brown (1966 cited in Bassett, 1986) found that..., or

White, (1990) as cited in Black (1994), suggests that...

**Captions under tables, pictures, etc:**

Source: National Statistics Office, 1985

***Stating sources (at the end of the paper)*****Books by up to three authors**

Redman, P. (2006). *Good essay writing: a social sciences guide*. 3rd ed. London: Open University in assoc. with Sage.

Barker, R. Kirk, J. & Munday, R.J. (1988). *Narrative analysis*. 3rd ed. Bloomington: Indiana University Press.

**Books by four or more authors**

Grace, B. et al. (1988). *A history of the world*. Princeton, NJ: Princeton University Press.

**Book chapters**

Smith, J. (1975). A source of information. In: W. Jones, ed. 2000. *One hundred and one ways to find information about health*. Oxford: Oxford University Press. Ch. 2. or

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