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ORIGINAL SCIENTIFIC PAPER

Understanding Media Consumption of Electronic Sports through Spectator Motivation, Using Three Different Segmentation Approaches: The Levels of Addiction, Passion, and Fan Identification

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Abstract

Electronic sports (eSports), or competitive video gaming, is a type of sport that has recently expanded its horizon from being a participatory sport to a spectator sport fueled by its wide popularity. In this regard, it is necessary to investigate why fans enjoy this new sports genre as a spectator sport. This study examines motivations of eSports spectators in different segments to gain a better understanding of the behaviors of this growing population. Specifically, this study aimed to (a) investigate eSports spectators' motivations to discover the motives for their attachment to eSports, using eleven different factors, and (b) explore differences in motivations among levels of addiction, fan identification, and passion. An analysis of 368 eSports fans showed that they valued the Achievement and Economics factors most in watching eSports. They even experienced a sense of achievement and a certain pecuniary advantage that real sports spectators experience. In addition, the Escape factor was identified as being the most important factor in explaining a passion for eSports-watching. This study also discovered significant differences between the eleven spectator motives, demonstrating the effectiveness of segmentation analysis in investigating the behaviors of sports fans. In particular, the Economics and Escape factors revealed meaningful differences between groups for all segments. This study showed that eSports spectators watch this new type of sports based on motivations that are similar to those of existing sports fans; furthermore, it identified significant differences in spectator motivations depending on their level of involvement in eSports.

Key words: media consumption, eSports, spectator motivation, addiction, passion, identification

Introduction

The distribution of computers and the development of the Internet has brought about great changes in sports, as they have in many aspects of our daily lives. Electronic sports (eSports) refers to the activity of enjoying a diversity of games using computers and the Internet. This new form of sports has experienced dramatic growth, and its popularity has even

threatened traditional sports (Warman, 2015). The biggest advantage of eSports is that people can enjoy it in any place, at any time, with anyone around the world, as they are free from the restrictions of time and place through the benefit of the Internet. In response to the rising popularity of eSports, professional gamers, professional teams, and professional leagues were created, similar to those in existing traditional sports (e.g., ba-



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seball, basketball, or soccer), and numerous global companies started investing huge amounts of money to buy sponsorships (Keiper, Manning, Jenny, Olrich, & Croft, 2017). The sudden growth of eSports gave rise to another trend: people not only played eSports but also started watching them. In other words, eSports, as an emerging sports genre, has expanded from being a participation sport to a spectator sport (Jenny, Manning, Keiper, & Olrich, 2016; Wagner, 2006).

On the Internet, people watch gameplay by professional gamers who belong to specific professional eSports teams sponsored by global companies; they also watch professionally commentated eSports games on TV, which are aired by broadcasters that bought broadcasting rights (Hamari & Sjöblom, 2017). The number of fans worldwide who watch eSports through media has exceeded 205 million, while 28 million people in North America and Europe claim that they consider themselves eSports fans (Casselman, 2015). The objective figures of eSports surprisingly go well beyond those of traditional sports. This phenomenon became even more evident when eSports was adopted as one of the games in the 2018 Asian Games in Indonesia (Selvaraj, 2018). The fact that eSports has been adopted by an international mega-sporting event, where professional athletes of officially recognized traditional sports compete with each other and represent their own countries, is powerful evidence pointing to the status of eSports as a spectator sport. Nevertheless, until now, most literature regarding eSports, generally, and consumer behaviors in eSports in particular, have focused on consumers' participation motivations (Lee & Schoenstedt, 2011). However, since a number of global eSports events have been held successfully, with an increasing number of spectators (Warr, 2014), it is necessary to consider why people like to watch eSports.

Sports fans watch their favorite sports for different reasons, and it is extremely important to investigate and understand spectator motivations in order to provide them with satisfactory results (Kim, Greenwell, Andrew, Lee, & Mahoney, 2008). Researchers have studied the key motivational factors that influence the behaviors of sports spectators to understand their spectator motivations (Funk, Mahony, & Ridinger, 2002; Trail & James, 2001). Such attempts first materialized with the Sport Fan Motivation Scale (SFMS) developed by Wann (1995); the Motivation Scale for Sport Consumption (MSSC) was established later by Trail and James (2001), and the Sport Interest Inventory (SII) by Funk, Mahony, Nakazawa, and Hirokawa (2001). Owing to these efforts, a general idea regarding consumers' spectator motives has been established to a certain extent. However, endeavors to investigate consumer behaviors continue, as there can be more varied spectator motivations for a wide range of sports genres (Bilyeu & Wann, 2002). In the same vein, this study will provide further insight to eSports spectators—a subject that has been little investigated to date.

As a new sport with exponential growth, it is important to understand why consumers are drawn to the sport to market the events more effectively. Furthermore, it is important to understand why different segments of spectators are watching eSports; consumer segmentation is therefore essential to investigate these consumer behaviors. Traditional sports consumers have often been segmented on the basis of fan identification (Trail, Anderson, & Fink, 2000; Shapiro, Ridinger, & Trail, 2013). The term “identification” has been defined as “an individual's orientation regarding affection or emotion toward different objectives” (Trail et al., 2000).

To understand sports fans' behaviors, various researchers have emphasized the importance of identification (Matsuo-ka, Chelladurai, & Harada, 2003; Robinson & Trail, 2005). In addition, a psychological variable such as “passion” has been utilized recently to segment sports consumers and understand their behaviors (Wakefield, 2016). According to Vallerand et al. (2003), “passion” is defined as “a strong inclination toward an activity that an individual likes, considers important, and invests time and effort in.” Accordingly, the passion of sports fans is evaluated on the basis of how much they like the sport; how high a value they attribute to it; how much time, effort, and emotion they invest in it; and the sense of loss they experience when their team loses the sport (Wakefield, 2016). Passion is distinguished from general involvement and self-consciousness in that it includes the concept of desire. Therefore, a consumer with a high level of passion will more likely become an avid consumer (Thomson, MacInnis, & Park, 2005).

Lastly, prior research investigating consumer behaviors related to eSports has often segmented consumers based on their level of addiction (Gaetan, Bonnet, Breard, & Cury, 2014; Lemmens, Valkenburg, & Peter, 2009), where “addiction” is defined as “excessive and compulsive use of video games that results in social and/or emotional problems; despite these problems, the gamer is unable to control this excessive use” (Lemmens et al., 2009, p. 78). Most of the previous research focused on mental disorders (Loton, Borkoles, Lubman, Polman, 2015), social conflict (Beranuy, Carbonell, & Griffiths, 2013), or sedentary lifestyles (Studer, Deline, N'Goran, Baggio, & Gmel, 2016) as precursors to strong commitment, involvement, or identification in eSports. As such, measuring levels of addiction is an appropriate way to understand diverse types of eSports consumers.

The current study was guided by the following two research questions:

RQ1: Which eSports motives predict addiction, passion, and identification toward eSports?

RQ2: What are the differences in spectator motivations based on the level of game addiction, passion, and fan identification?

Methods

Participants and data collection

The target population for this study is people in the United States who watch eSports through various platforms (e.g., internet and/or television). Subjects were individuals over 18 years old who identify themselves as eSports fans. Using Amazon Mechanical Turk (MTurk), which is an online survey service provided from Amazon, Inc., the data collection procedure was implemented for 30 days with eSports fans. Prior to data collection, all research respondents were informed about research purposes, survey discontinuance, and human subjects protection requirements from the University's Institutional Review Board (IRB). The subjects were individuals who identified themselves as an eSports fan, reliable online respondent (i.e., A+ rated MTurk worker, HIT Approval Rate for all Requesters' HITs greater than 95, and number of HITs Approved greater than 100), and resident of the United States.

Instruments and analysis

An instrument (7-point Likert-type scale) was developed from the two most popular and extensively used scales: The Motivation Scale for Sport Consumption (MSSC; Trail & Ja-

mes, 2001) and the Sport Fan Motivation Scale (SFMS; Wann, 1995). Based on results of Cronbach's alpha coefficient and the average variance extracted (AVE), each motivational factor in both scales were compared to extract the most reliable motivational factors. As a result, Aesthetics, Drama, Knowledge, Physical Skills, Social Interaction, and Vicarious Achievement from the MSSC (Trail & James, 2001), and Economics, Escape, and Entertainment from the SFMS (Wann, 1995) were selected.

The current study utilized and modified three different scales (7-point Likert-type scale) to segment eSports spectators: (a) the Game Addiction Scale (GAS) (Lemmens et al., 2009), including seven factors; salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems, (b) the Points of Attachment Index (PAI) (Shapiro et al., 2013), including four factors; players, team, sport, and a general sport fan with 12 items, and (c) the four-item Passion scale, including "How passionate are you about eSports?", "During the season, to what degree do eSports occupy your mind?", "During the eSports season, how much do you prioritize your time so that you can follow your favorite eSports?", and "When it comes to how you feel about eSports in your life, I can't live without eSports" (Wakefield, 2016).

Lastly, prior to the main data analysis, confirmatory factor analysis (CFA) using SPSS AMOS 22.0 was performed to confirm the number of factors required in the data and which measured variable is related to which latent variable. Additionally, Cronbach's alpha was utilized to test reliability of variances.

Results

Descriptive statistics

A total of 608 surveys were distributed via MTurk, and 402 surveys were returned (approximately 66.12% response rate) from respondents who self-identified as eSports consumers over the age of 18. After excluding 34 inappropriate surveys, a

total of 368 surveys were finally utilized in this study. The sample of the current study consisted of 251 (68.2%) males and 117 (31.8%) females. In addition, 63.9% (n=235) of the sample were between the ages of 19 and 30 years old. General demographics of eSports showed that 61 percent of eSports spectators are male, and 38 percent are female (Casselmann, 2015). Additionally, 56 percent of eSports fans were found to be between the ages of 21 and 35, and 28 percent were between the ages of 36 and 65 (Casselmann, 2015). Hence, gathering data from the selected sample will be significant because more than 84 percent of eSports fans fall in to the target population for this study.

Validity and reliability

For all variables developed to explore spectator motivations (9 factors with 27 items) for eSports spectators, confirmatory factor analysis (CFA in SPSS AMOS version 22.0) was performed. All the observed fit statistics showed a good fit (Kline, 2005) to the data ($\chi^2=601.903$, $df=288$, $p<0.01$, normed fit index [NFI]=.907, comparative fit index [CFI]=.949, root mean square error of approximation [RMSEA]=.054). Cronbach's alpha of items ranged from .712 to .961, which exceeded the cut-off (>.70; Nunnally & Bernstein, 1994).

Research question 1

To discover what motives are connected to their attachment (i.e., addiction, passion, and identification) to the eSports, three multiple regression analyses were conducted separately for the first research question. First, for the eSports addiction, Escape, Vicarious Achievement, and Economics were found to be significant predictors. Second, for the passion towards eSports, Vicarious Achievement, Economics, Escape, Knowledge, and Aesthetics were found to be significant predictors (Table 1). For the fan identification with eSports, Knowledge, Vicarious Achievement, and Economics were found to be significant predictors.

Table 1. Results of Multiple Regressions by Addiction, Passion, and Identification

VARIABLES	IV s	B	β	t	R ²	ADJ R ²	F
Addiction	ESC	.51	.32	5.89***	.30	.28	16.91***
	ACH	.45	.26	4.34***			
	ECO	.40	.24	4.50***			
Passion	ACH	.32	.28	5.37***	.47	.46	35.35***
	ECO	.23	.22	4.64***			
	KNO	1.09	.39	8.37***			
Identification	ACH	.79	.25	5.50***	.60	.60	59.08***
	ECO	.54	.19	4.61***			

Legend: ACH=Vicarious achievement, AES=Aesthetics, Eco=Economic, ESC=Escape, KNO=Acquisition of knowledge; *** $p<.01$.

Research questions 2

To investigate differences in motivations among three groups (i.e., high, medium, and low) on the level of addiction, fan identification, and passion, three multivariate tests were performed separately. The detailed results were shown on Table 2. To identify high, medium, and low level of addiction, the average score of each factor was utilized to divide respondents into three groups (i.e., approximately 33.3% per group).

The first test revealed significant differences among three addiction groups (i.e., high, medium, and low) on the dependent variables [Wilks' lambda=.706, $F(18,714)=7.533$, $p<0.001$, partial $\eta^2=.160$]. Based on adjusted alpha level using Bon-

ferroni correction ($P=0.001/3=.0003$), the univariate ANOVAs for (a) Vicarious Achievement, (b) Economics, (c) Escape, and (d) Knowledge.

The second test revealed significant differences among three passion groups (high, medium, low) on the dependent variables [Wilks' lambda=.613, $F(18,714)=11.011$, $p<0.001$, partial $\eta^2=.217$]. Based on adjusted alpha level using Bonferroni correction ($P=0.001/3=.0003$), the univariate ANOVAs for (a) Vicarious Achievement, (b) Aesthetics, (c) Economics, (d) Entertainment, (e) Knowledge, and (f) Social were statistically significant.

Table 2. Results of MANOVAs: Differences in spectator motivations based on addiction, passion, and identification

IV	DV	df	F	η^2
Addiction	ACH	2	21.652***	.106
	ECO	2	24.486***	.118
	ESC	2	38.256***	.173
	KNO	2	10.817***	.056
Passion	ACH	2	56.276***	.236
	AES	2	21.412***	.105
	ECO	2	30.882***	.145
	ENT	2	9.126***	.048
	KNO	2	55.068***	.232
	SOC	2	23.996***	.116
Identification	ACH	2	85.401***	.319
	AES	2	26.423***	.126
	ECO	2	37.905***	.172
	ENT	2	14.768***	.075
	ESC	2	30.034***	.141
	KNO	2	148.103***	.450
	PHY	2	13.680***	.070
	SOC	2	41.628***	.186

Legend: ACH=Vicarious achievement, AES=Aesthetics, ECO=Economic, ENT=Entertainment, ESC=Escape, KNO=Acquisition of knowledge, PHY=Physical skills, SOC=Social; ***p<0.001.

The third test revealed significant differences among three fan identification groups (high, medium, low) on the dependent variables [Wilks' lambda=.456, $F(18,714)=19.050$, $p<0.001$, partial $\eta^2=.324$]. Based on adjusted alpha level using Bonferroni correction ($P=0.001/3=.0003$), the univariate ANOVAs for (a) Vicarious Achievement, (b) Aesthetics, (c)

Economics, (d) Entertainment, (e) Escape, (f) Knowledge, (g) Physical Skills, and (h) Social were statistically significant. Additionally, the follow-up Tukey post hoc analyses revealed significant differences among groups on variables. Detailed mean scores of each group on variables were reported Table 3.

Table 3. Mean scores for spectator motivations among groups based on addiction, passion, and identification

	ACH	AES	DRA	ECO	ENT	ESC	KNO	PHY	SOC
Addiction									
High	5.21	5.34	5.50	3.17	5.41	5.27	4.26	5.26	4.71
Mid	4.77	5.46	5.59	2.34	5.76	4.68	3.82	5.58	4.77
Low	3.95	4.90	5.40	1.71	5.40	3.53	3.22	4.96	4.14
Passion									
High	5.58	5.74	5.69	3.23	5.80	5.31	4.77	5.57	5.27
Mid	4.69	5.32	5.53	2.34	5.64	4.63	3.93	5.28	4.51
Low	3.67	4.66	5.29	1.62	5.16	3.49	2.67	4.95	3.87
Identification									
High	5.80	5.77	5.74	3.32	6.00	5.37	5.29	5.78	5.48
Mid	4.59	5.34	5.52	2.33	5.46	4.27	3.79	5.19	4.50
Low	3.46	4.53	5.23	1.48	5.11	3.71	2.18	4.82	3.62

Legend: ACH=Vicarious achievement, AES=Aesthetics, DRA=Drama, ECO=Economic, ENT=Entertainment, ESC=Escape, KNO=Acquisition of knowledge, PHY=Physical skills, SOC=Social; Statistically significant higher mean scores between groups in bold.

Discussion

This study aimed to understand consumer behaviors of eSports spectators, using three distinct types of segmentation (e.g., GAS, Passion, and PAI). The research efforts contribute to (a) exploring which spectator motives predict attachment to eSports, and (b) investigating differences based on segments of eSports spectators. The results of this study revealed significant factors that motivate eSports fans' spectating behaviors, suggesting that eSports spectators value Achievement and Economics factors the most. Interestingly, the findings indicated that eSports fans also felt a sense of achievement and expected a certain pecuniary advantage through watching eSports, like

spectators in general sports (Funk et al., 2002; Wann, Grieve, Zapalac, & Pease, 2008). Furthermore, a noticeable finding was that the Escape factor was exceptionally strong in explaining addiction, unlike passion and fan identification. The result might be closely related to a finding from a previous study that people who report relative higher scores on addiction often show problems such as social conflict or isolation (Beranuy et al., 2013).

Additionally, this study confirmed the necessity of different segmentation approaches and identified significant differences from consumer to consumer, based on the level of involvement in eSports. Specifically, given that almost all results from

eleven spectator motivations revealed statistically significant differences between groups (e.g., low, medium, and high), regardless of the types of segmentation, (a) the level of addiction, (b) passion, and (c) fan identification, these factors proved to be effective ways to segment spectators in eSports. Particularly, Economics and Escape showed statistically significant differences between groups on all segments and additional post hoc tests. As the level of attachment went from low to high regardless of the segment types, the mean scores of the two factors changed drastically. That is, the more people are attached to eSports, the more they are affected by Economics and Escape motivational factors. However, two factors (i.e., Drama and Entertainment in Addiction, and Drama in Passion) were not statistically significant between groups, indicating that most consumers were driven by these motives regardless of their level of attachment.

This study analyzed the consumer psychology of spectators of the newly emerging sports and suggested meaningful findings. The results provide important insights for understanding recent changes in the sports industries. Concretely, although eSports games are very different from traditional sports, the factors that motivate eSports consumers to watch eSports games were not very different from those for traditional sports. This may indicate that eSports can also be defined and recognized as a genre of sports. In addition, this study also discovered that, even though the behaviors of the same consumers are analyzed with regard to the same sports, the results may vary widely depending on how they are segmented and under what standards. This suggests that it is necessary to approach consumer behaviors from more diverse perspectives. The psychology of eSports spectators uncovered by this study certainly contributes to enriching the existing literature of spectator motivation studies. This study also demonstrated that passion and addiction are important segmentation approaches, apart from identification, which is the conventional variable of consumer segmentation analysis frequently used in previous studies. This is a meaningful contribution for future studies of consumer behavior.

Limitations and Future Research

There are several limitations in this study. First, this study did not classify the type of media the eSports spectators used, even though the media platforms they use vary. Spectator motives may also vary accordingly, because each media platform features different characteristics. In this respect, it would be vital for future studies to comparatively analyze spectator motives between watching sports on smartphones and watching them on television.

Finally, the age of study participants and the average duration of their daily eSports watching can be very important variables for eSports, as eSports are relatively more popular among young people, who use the Internet and computers more widely than older people. Nevertheless, they were not specifically analyzed in this study. Future research may obtain more meaningful results by introducing more relevant or significant variables. Continued attempts from more diverse perspectives will certainly contribute to a more concrete and accurate consumer analysis of eSports spectators.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Comparative Study of Anthropometric Measurement and Body Composition between Junior Soccer and Volleyball Players from the Serbian National League

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Abstract

The purpose of this study was to describe anthropometric characteristics and body composition of junior soccer and volleyball players from the Serbian National League as well as to make a comparison between them. Seventy-one male athletes were enrolled in this study, divided into three groups: twenty-five soccer players, fourteen volleyball players and thirty-two healthy sedentary subjects. All subjects were assessed for anthropometric measures required for the calculation of body composition variables, using standardized procedures recommended by previous studies. Data was analysed using SPSS and the descriptive statistics were expressed as a mean (SD) for each variable, while the ANOVA and the LSD Post Hoc tests were carried out to detect effects of each type of sport. The results showed that a significant difference was found in variables height, weight, and body fat, but no significant difference was found in the remaining three variables, body mass index, muscle mass or bone content. Volleyball players were significantly taller and heavier than soccer players or subjects from the control group, while there was no significant difference between height and weight of soccer players and subjects from the control group. Subjects from the control group had significantly higher percentage of body fat than both soccer and volleyball players. Soccer players had the lowest percentage of body fat, while subjects from the control group had the highest values of the same variable. Therefore, these findings may give coaches from the region better working knowledge and suggest to them to follow recent selection process methods and to be more careful during the process of talent identification.

Key words: sport, junior, soccer, volleyball, male athletes

Introduction

All competitive sports played at the professional level require that the body performs at the optimal biomechanical and physiological capacity (Zaccagni, 2012). Logically, junior athletes competing in top leagues which have high requirements at certain age levels are expected to have optimal physique, strength, and endurance for the functional requirements of the sport in question. However, a subjective opinion of so-called expert coaches often has influence on which gifted

athletes will be selected (Matthys et al., 2011). Nevertheless, it is widely known that there is a growing interest in improving performance of athletes related to characteristics associated with consciousness, awareness and cognitive effort as well as identifying talents, strengths and weaknesses, assigning player positions and helping to design optimal training programs (Popovic, Akpinar, Jaksic, Matic, & Bjelica, 2013) all over the world, including Western Balkan countries. However, in many places a lot of time is spent on increasing the physical fitness



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of athletes without taking into consideration the assessment of their body composition and their nutritional status (Triki et al., 2012). Contemporary sport science is designed to improve performance and to identify talents as precisely as possible and for athletes at all age levels. Many studies have shown that specific anthropometric characteristics are significantly associated with sports results (Masanovic, 2018). Identification is very demanding, as various sporting events require differing body types to achieve maximum performance (Masanovic & Vukasevic, 2009). Therefore, understanding body composition of athletes, and then assigning it with corresponding competitive weights, has been done for decades and is considered an essential part of the overall management process (Popovic, Bjelica, Jaksic, & Hadzic, 2014). On the other hand, although children and adolescents who play sports grow in a manner similar to non-athletes, it is widely addressed in the scientific literature that adequate profiles are primarily important in various sports, mostly due to the reason that absolute size contributes to a significant percentage of the total variance associated with sports results (Rexhepi & Brestovci, 2010). Therefore, scientists all over the world are looking for a standard formula that could improve the performance of players and discover talents as efficiently as possible (Popovic et al., 2013).

Anthropometrical characteristics and body composition of athletes have been the subject of many investigations as many researchers have hypothesized that athletes in training might be expected to exhibit structural and functional characteristics that are specifically favourable to sports they play (S. Singh, K. Singh, & M. Singh, 2010). Since each sport has its own specific demands, every athlete should have specific anthropometrical characteristics and body composition related to sports disciplines involved. Correct body composition assessment is important in sport, since errors may lead to mistakes in training prescription and diet elaboration, and therefore affect athletic performance (De Oliveira-Junior et al., 2016). Some sports, such as wrestling, require further investigation of this topic, because of weight limits as well as favouring the selection of athletes with a limited vertical skeletal development (Popovic et al., 2014). Another example is arm wrestling which requires the selection of athletes with longer forearm bones (Akpınar, Zileli, Senyuzlu, & Tunca, 2012). The need to investigate data obtained from investigation of anthropometrical characteristics and body composition of soccer and volleyball players is as important as adequate body composition and body mass which, among other factors, contribute to optimal exercise routines and performance (Massuca & Fragoso, 2011). According to these two authors, body mass can influence athlete's speed, endurance, and power, whereas body composition can affect strength and agility. In other words, successful participation in both soccer and volleyball games, requires not only a high level of technical and tactical skills, but it also requires from each athlete suitable anthropometrical characteristics and body composition. Most of the descriptive data concerning characteristics of soccer and volleyball players come from America and Western Europe. There is a lack of data from Eastern Europe, especially the Western Balkan region. Hence, this study aims to verify if data collected regarding anthropometrical characteristics and body composition of Western Balkan athletes, where general population had specific measures (Popovic, 2017; Masanovic, 2018a), support previous studies that have evaluated ideal anthropometric profiles of successful soccer players (Saether, 2017; Herdy, Costa, Simao, & Selfe, 2018) and

volleyball players (Bayios et al., 2006; Gaurav, M. Singh, & S. Singh, 2010), giving an insight into requirements for competing at the zenith of related sports.

Soccer is a sport game played in the open field, and training is usually based on the movement, expressed through endurance, which consists of a series of moderate activities, followed by alternating periods of high intensity, which leads to a significant metabolic heat production (Gusic, Popovic, Molnar, Masanovic, & Radakovic, 2017). Indeed, soccer requires a high standard of preparation through the development of physical performance skills, as well as tactical and technical expertise, in order to complete 90 minutes of a competitive play. According to Triki et al. (2012), soccer training is mainly based on movement, implementing endurance qualities consisting of moderate activity alternating with periods of intermittent high intensity, leading to a significant production of metabolic heat, mostly due to the fact that the average work intensity, during a soccer match, is usually about 75–90% of maximum heart rate, respectively 70–85% of VO₂max (Rexhepi & Brestovci, 2010). On the other hand, volleyball is generally played in an indoor field that is much smaller in respect to a soccer field, in which two teams of six players are separated by a net (without mutual contacts between players). It requires a high standard of preparation in order to complete three sets of competitive play and to achieve high results. In this game, movement patterns significantly differ from those in soccer, as it requires much more effective attack and defense as well as dominance over the net, which is the most decisive factor for a victory (Hurst et al., 2017; Loureiro et al., 2017). Top-level volleyball players do not have VO₂max values on a high level as typical endurance trained elite players in other sports do, but they have an optimum level of aerobic capacity that is required for playing this game since it may sometimes continue for a long time (Lidor & Ziv, 2010). This game also includes a large number of spiking, jumping, power hitting, blocking, and setting that is mainly based on a high level of strength and power (Loureiro et al., 2017).

Hence, the purpose of this study is to describe anthropometric characteristics and body composition profiles of junior soccer and volleyball players from the Serbian National League, and to detect possible differences in relation to the competition levels.

Methods

Seventy-one male athletes were enrolled in this study. They were divided into three groups: twenty-five soccer players (16.64±0.49 yrs.) from the Serbian Junior Premier League, fourteen volleyball players (17.36±0.74 yrs.) from the Serbian Junior Premier League and thirty-one healthy sedentary subjects from the same country (17.34±0.60 yrs.). The measurements were carried out in the winter preparation period.

All subjects were clinically healthy and had no recent history of infectious disease, asthma or cardio-respiratory disorders. All of them gave their written consent and the local ethics committee approved the protocol of the study. All subjects were assessed for anthropometric measures required for the calculation of body composition variables, using the standardized procedure recommended by the International Biological Program (IBP) standards respecting the basic rules and principles related to the parameter choice, standard conditions and measurement techniques, as well as the standard measuring instruments adjusted before the measurement was carried out. Height and weight were measured in the laboratory with

the subject dressed in light clothing. Height was measured to the nearest 0.1 cm using a fixed stadiometer, and weight was measured to the nearest 0.1 kg with a standard scale utilizing a portable balance. Body mass index (BMI) was calculated as body mass in kilograms divided by height in meters squared (kg/m^2). Skinfolts (mm) were measured at six sites: triceps skinfold thickness, forearm skinfold thickness, thigh skinfold thickness, calf skinfold thickness, chest skinfold thickness and abdominal skinfold thickness (using a skinfold caliper). Each individual measurement and the sum of the six measurements were used for further analysis. The circumferences of the upper and lower arm and the upper and lower leg were measured in centimeters and the following diameters were measured to the nearest 0.1 cm: elbow diameter, wrist diameter, knee diameter, ankle diameter, upper arm diameter, forearm diameter, thigh diameter, and calf diameter. To reduce measurement variation, the same investigator examined all of the subjects.

The data obtained in the research was processed using the

application statistics program SPSS 20.0, adjusted for use on personal computers. The descriptive statistics were expressed as a mean (SD) for each variable. Analysis of variance (ANOVA) and the LSD Post Hoc test were carried out to detect effects for each type of sport (soccer or volleyball) for each variable: height, weight, body mass index (BMI), and muscle mass, bone content and body fat. The significance was set at an alpha level of 0.05.

Results

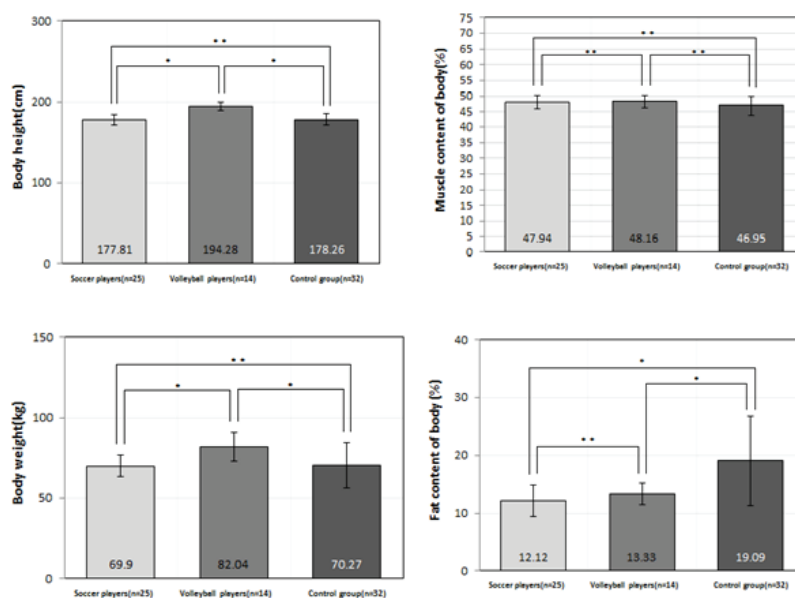
Anthropometric characteristics of subjects are shown in Table 1. There were significant differences in three out of five variables among the groups. Hence, a significant difference was found for height ($F=32.90$), weight ($F=6.58$) and body fat ($F=12.34$). There is no significant difference in the remaining three variables: body mass index ($F=0.09$), muscle mass ($F=1.55$) or bone content ($F=1.09$).

Table 1. Descriptive data and ANOVA of male athletes enrolled in the study (n=71)

Variables	Soccer (n=25)	Volleyball (n=14)	Control (n=32)	ANOVA
Mean \pm Standard Deviation				
Height (cm)	177.81 \pm 6.63	194.28 \pm 5.30	178.26 \pm 7.27	0.000*
Weight (kg)	69.90 \pm 6.78	82.04 \pm 8.85	70.27 \pm 14.09	0.002*
BMI (kg/m^2)	22.10 \pm 1.74	21.71 \pm 1.81	22.11 \pm 4.27	0.918^
Muscle mass (%)	47.94 \pm 2.12	48.16 \pm 2.20	46.95 \pm 3.02	0.220^
Bone content (%)	16.76 \pm 1.48	16.52 \pm 1.20	17.34 \pm 2.47	0.343^
Body fat (%)	12.12 \pm 2.78	13.33 \pm 1.93	19.09 \pm 7.77	0.000*

Legend: n=number of subjects; BMI=body mass index; ^=non-significant; *=significant difference between the groups

Significant differences of anthropometric characteristics among particular sports are shown in Figure 1.



Legend: *=significance ≤ 0.01 ; **=non-significance

Figure 1. The LSD Post Hoc test for different parameters among the subjects

The LSD Post Hoc test indicated that volleyball players were significantly taller and heavier than soccer players or subjects from the control group, while the latter had significantly more percentage of body fat than soccer and volleyball players. Soccer players had the lowest percentage of body fat, while subjects from the control group had the most body fat. No significant

difference was found for the other variables. However, it was noticed that volleyball players had the lowest body mass index, while subjects from the control group had the highest values. Lastly, volleyball players had the highest percentage of muscle mass, while subjects from the control group had the lowest values.

Discussion

Results of this study support previous investigations indicating a strong difference regarding body height among volleyball players on one side and soccer players and subjects from the control group that represents general population on the other side (Gaurav et al., 2010; Popovic, Masanovic, Molnar, & Smajic, 2009; Masanovic, Milosevic, & Corluka, 2018). Thus, this confirms the well-known axiom that selection is the main reason that can explain the observed difference, while selection criteria, different type of play and game rules between soccer and volleyball can also explain the observed difference (Popovic et al., 2013). However, a rather more important finding regarding body height is the fact there was no significant difference among soccer players and subjects from the control group representing the general population, mostly due to the reason there has been a tendency to recruit taller and heavier soccer players (S. Gil, J. Gil, Ruiz, A. Irazusta, & J. Irazusta, 2010). The absence of differences between soccer players and subjects from the control group in this study, raises doubts that the selection process has been carried out correctly, especially because soccer players are shorter than subjects from the control group. Nevertheless, it has to be considered that the average body height of all the participants in the FIFA U-17 World Soccer Championship India 2017 was 176.01 centimeters, while the average body height of the national team of Mali, who played the semi-finals of the aforementioned championship, was only 166.81 (the top goal scorer of Mali was Lassana Ndiaye and he was just 170 centimeters tall, while there were nine of his team players who were shorter than 160 centimeters). On the other hand, Philip Foden, the best young player in England and the best one of FIFA U-17 World Soccer Championship in India 2017 was 169 centimeter tall, while the most valuable Brazilian players, Paulinho and Brenner were 174 and 175 centimeters tall; although one more Englishman, Rhian Brewster, top goal scorer of the whole championship was 177 centimeters tall. Mentioned official statistical data proved that soccer players were tall enough removing all doubts about having to be taller than the general population. The tendency to recruit taller soccer players is not unsworn in the scientific literature yet (Popovic, Smajic, Joksimovic, & Masanovic, 2010; Nikolaidis & Vassilios-Karydis, 2011; Herdy et al., 2018). On the other hand, volleyball players tend to be tall because they are players handling a ball above their heads (Gaurav et al., 2010) and their body height helps them to reach high and close to the net as well as to defend the ball against the opponents. Taller players in volleyball have an advantage because they can easily control both defensive and offensive actions over the top of the net (Popovic et al., 2014). Thus, the selection criteria can explain the observed results, as there has been a tendency to recruit the tallest children in volleyball, too. However, extra talented short players, especially those with a high vertical jump, shall also be selected and play a significant role. This conclusion can confirm the fact that professional volleyball players, even the shortest ones, are usually above the average height compared to the general population (Popovic et al., 2014). For example, the average body height of the volleyball teams who played the finishing line CEV U17 Volleyball European Championship 2017 in Turkey were as it follows: Russia (199.1 cm), Belarus (192.44 cm), Greece (187.5 cm), Italy (192.33 cm), Bulgaria (195.84 cm), Netherlands (188 cm), while the average body height of all participants in the championship was 189 cm. This proves that junior volleyball players from the Serbian Na-

tional League were tall enough and did not lag behind the top European players. However, this is not a surprise, as it is well-known that the density including very tall subjects appears to be characteristic of people from this area (Western Balkan), since a high percentage of people from general population were measured at 190 cm or more (Bjelica et al., 2012; Pineu, Delamarche, & Bozinovic, 2005; Popovic, Bjelica, Molnar, Jaksic, & Akpinar, 2013a). Therefore, this fact may give coaches, especially those from the Dinaric Alps, better working knowledge regarding this particular group of athletes and suggest to them to follow recent talent identification process methods and to be more careful during the recruitment as they have a very tall population on their hands in general (Pineu et al., 2005). Furthermore, it was expected that volleyball players were heavier than subjects from the control group or soccer players, mostly due to the fact they are significantly taller than both groups mentioned. However, the reason we have so heavy volleyball players may also be related to the fact that the average size of volleyball players has increased dramatically in the past 20-30 years. This could be because of a better nutrition, especially in elite volleyball leagues, partly due to the use of nutritional supplements.

The body mass index (BMI) is a parameter that is widely used in adult population as an internationally recognized definition for overweight and obesity (Kovac, Jurak, & Leskosek, 2012). Fortunately, body mass index of subjects from all three groups was within the normal limits according to previous studies (Popovic et al., 2009) and it did not show any significant differences among the groups. Also, we did not find any significant differences among the groups regarding muscle mass as well. While increasing lean body mass is important to improve strength and power, relevant to sport performance (Nikolaidis & Vassilios-Karydis, 2011), it is not a worry factor. Muscle mass of soccer and volleyball players from this study corresponds to the values obtained from the previous studies (Jeukendrup & Gleeson, 2009), however significant differences in muscle mass were observed in later age (Masanovic, 2008). Bone content of subjects from all groups of athletes was proportional to the longitudinal and transversal dimension of the skeleton, and it did not show any significant differences among the groups.

In sports like soccer and volleyball, it is well known that excessive fat mass compromises physical performance (Nikolaidis & Vassilios-Karydis, 2011). Therefore, a low percentage of body fat of soccer and volleyball players from this study, which was significantly lower than the percentage of body fat of subjects from the control group, showed that our players have a high level of physical performance. However, soccer players had significantly lower percentage of body fat, as expected, because many previous studies recognized soccer as a predominantly aerobic sport (Santos-Silva, Fonseca, De Castro, Greve, & Hernandez, 2007; Herdy et al., 2018), while anaerobic energy is essential only to performance in sprints, high-intensity runs, and duel plays, all of which may contribute to the final outcome of a game (Sporis, Ruzic, & Leko, 2008; Gardasevic, Georgijev, & Bjelica, 2012). Volleyball training contains more anaerobic activity than soccer, mostly due to intermittent nature of the game and continuous changes in response to different offensive and defensive situations. This sport demands more high-intensity anaerobic exercises done at short and explosive bursts. Furthermore, it is very important to remember that athletes in elite team sports such as soccer and volleyball need a

certain body fat percentage to perform well enough and achieve their full playing potential. The National Strength and Conditioning Association indicates that body fat percentages vary from less than 7 percent to 17 percent among male athletes, depending on the sports discipline. However, the authors of this study would like to highlight that these are just guidelines and that athletes should work closely with their coaches and their personal physicians to determine the appropriate individual body fat percentage to enhance their physical abilities and their health.

The importance of body composition in sport performance is a primary concern in creating athletes' profiles as well as conditioning programs throughout a season at all levels of competitions (Silvestre et al., 2006), as describing anthropometric characteristics and body composition of athletes and detecting possible differences in relation to competition levels may give coaches a better working knowledge of the studied groups of athletes. Moreover, the results of this study suggest that soccer and volleyball players had a lower percentage of body fat in comparison to the control group. On the other hand, this study also suggests that soccer and volleyball players had slightly increased muscle mass, while differences in bone content are a logical consequence. The part attributed to the body height is the main cause of the selection process, and lastly, the part attributed to body weight could be the main cause consequence of nutritional habits. Considering that the measurements were conducted in the middle of the season, this study is limited by the fact that changes in body composition and physical performance may occur from the start to the end of an athlete's training and competitive season (Silvestre et al., 2006; Kraemer et al., 2004), reported that soccer players who enter a season with a high catabolic metabolic status could experience reductions in performance during a competitive season accompanied by detrimental changes in body composition. Accordingly, further studies should be very careful in projecting timelines for measuring anthropometric characteristics and body composition, mostly due to the fact that it has to be conducted either at the beginning or at the end of a season. It also has to be explicitly reported when the measurement is exactly conducted.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Age and Gender Differences in Nutritional Status of School Children According to WHO, CDC and IOTF References: A Statewide Study from Montenegro

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Abstract

Nutritional status of school children has been discussed over the past decade, focusing on timely and adequate response that can positively affect the reduction of the health risks of overweight, obesity, and malnutrition. Thus, the aim of this study was to evaluate a nutritional status of healthy children from Montenegro according to three most common worldwide references. The sample of 1480 healthy school children was consisted of girls (N=733), mean age=10.98±1.38 years, mean body height BH=152.25±10.22 cm, and mean body mass BM=43.93±11.51 kg, and boys (N=747), mean age=10.95±1.41, mean BH=153.26±11.18 cm, and mean BM=46.16±13.21 kg. A nutritional status was defined by body mass index (BMI) and compared to the references developed by World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and International Obesity Task Force (IOTF). Prevalence differences relative to age and gender were analyzed as well. Results suggest that IOTF is the most appropriate method in absence of national references for growth and nutritional status. Furthermore, increase in prevalence of overweight and obese in boys was relatively high considering the time frame (5 years), while increase in girls was somewhat smaller, but nevertheless present. In total, every third (WHO) or every fourth (CDC and IOTF) child in Montenegro aged 9-13 years is either overweight or obese.

Key words: *body mass index, prevalence, obesity, overweight, underweight*

Introduction

According to World Health Organization (WHO), increasing trend of obesity among children and preadolescents is one of the leading health problems (WHO, 1995). The obesity can be caused by many factors such as genetics, socio-cultural or environmental factors. However, in majority of cases the obesity is caused by a nutritional disbalance due to higher calorie intake than can be spent during the day, which leads to storing the excess energy as fat tissue (Lukaski, 2017). Since the changes in nutritional status can be noticed in quickly accessible body composition characteristics such as body mass (BM), body height (BH) or waist circumference (WC), the

analysis of body composition became a standard tool in epidemiological and statewide studies (WHO, 2000).

In this type of research morphological measurements represent a basis for obtaining data (Bjelica, 2010). The screening of nutritional status in a pediatric population is very challenging process because of the fast growth and physical development, which characterizes childhood, preadolescence and adolescence (Cole, Flegal, Nicholls, & Jackson, 2007; Wang & Chen, 2012). Therefore, a precise, valid and reliable method should be used for these purposes. Assessment of anthropometric measurements is standardized method, commonly to estimate nutritional status of body composition, and



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globally used references are WHO, Centers for Disease Control and Prevention (CDC) and International Obesity Task Force (IOTF), (de Onis et al., 2007; Kuczmarski et al., 2002; Cole et al., 2007). In addition to the above references, several countries have developed national references to growth and development on nationally significant samples of their populations using similar methodology (Tambalis et al., 2015), but this is not case in Montenegro.

Various types of adaptation of human beings have, led to a change in the phenotype, which changed genotypes over generations (Bjelica, 2006). This has led to the development of different individuals within a community of living beings (Bjelica, 2006). Although a modern way of life brings up many advantages providing better and easier functioning of people, it is also evident that a negative adaptation such as nutrition transition and reduction of physical activity occurred as well (Ng et al., 2014). Especially sensitive periods that can be influenced by these changes are childhood and preadolescence whereby obese children and preadolescents are more likely to be obese adults (Ng et al., 2014). In contrast, increasing trend of underweight children can be noticed worldwide, which also can be a burden and lead to increased health risk (Tuan & Nicklas, 2009; Popkin, 2006). In that regards, developing a national normative values of body composition characteristics for an early detection of nutritional status of children and preadolescents plays an important role in prevention of obesity.

There has been a lack of comprehensive researches related to nutritional status of children from Montenegro. Except

from Martinovic et al. (2015) and Jaksic et al. (2017), next available data were from former Serbia and Montenegro from 2004. However, prevalence of overweight and obese children increased by one-third since then (Martinovic et al., 2015). A survey by the World Health Organization “European Childhood Obesity Surveillance Initiative-COSI”, conducted by 4,000 children in Montenegro, showed the worrying incidence of overweight and obesity in Montenegro (Institute of Public Health, 2016). In that regards, the main goal of this study was to evaluate current nutritional status in school children (9-13 yrs.) from Montenegro and to explore possible gender and age differences. Another objective was to compare the results with peers from the region and globally with studies that used similar methodology.

Methods

This study could be classified as a cross-sectional study design conducted on a stratified sample of school children from Montenegro aged 9-13 years. Children from three geographical regions (southern, central and northern) were included in the study and their nutritional status was evaluated and compared to three most common references: World Health Organization - WHO (de Onis et al., 2007), Centers for Disease Control and Prevention - CDC (Kuczmarski et al., 2002) and International Obesity Task Force - IOTF (Cole et al., 2007) and classified into four categories: Underweight, Normal, Overweight, and Obesity (Table 1).

Table 1. Cut-off values for used references for purpose of evaluation of nutritional status

References	Underweight	Normal	Overweight	Obesity
WHO	BMI-for-age Z-score<-2	BMI-for-age Z-score-2 to 1	BMI-for-age Z-score>1	BMI-for-age Z-score>2
CDC	BMI< 5 th percentile	BMI ≥5 th to<85 th percentile	BMI≥ 85 th percentile	BMI≥ 95 th percentile
IOTF	BMI<18.5 at age 18	BMI 18.5 to<25 at age 18	BMI 25 to<30 at age 18	BMI≥30 at age 18

Subjects

The sample of 1480 healthy school children were consisted of girls (N=733) and boys (N=747). The main characteristics for the girls were: mean age=10.98±1.38 years, mean body height BH=152.25±10.22 cm, and mean body mass BM=43.93±11.51 kg; and for the boys: mean age=10.95±1.41, mean BH=153.26±11.18 cm, and mean BM=46.16±13.21 kg. All measurements were conducted on a national level including southern, central and northern region of the country, during the school year 2017/18. School principals, parents and children were informed about the purpose of the measurement and children were measured only if everybody signed the informed consent prior the measurements were taken. Children with medical conditions (such as Down syndrome, Marfan syndrome, serious hormonal disorder, diseases that affect loss of muscle mass, reduction in bone density) were measured but excluded from the sample of this study. The research was carried out in accordance with the conditions of declaration of Helsinki, recommendations guiding physicians in biomedical research involving human subjects (Christie, 2000).

Measurement procedures

Nutritional status was estimated based on body mass index (BMI), whereby the BMI was calculated by dividing BM

in kilograms (kg) with square of BH in meters (m), BMI=BM/BH² and expressed in kg/m². Body height and body weight were measured using a SECA 220 (Seca GmbH & Co. KG.) weighing and measuring scale with a telescopic measuring rod, with the precision of 0.1 kg and 0.1 cm. All participants were dressed in shorts and T-shirt and during both measurements they were barefooted. Measurements were provided by trained and experienced staff from Faculty for Sport and Physical Education, University of Montenegro.

Statistics

The descriptive statistics for means (mean) and standard deviations (±SD) for BM, BW and BMI were calculated using a statistical package for social sciences (IBM, SPSS 20.0). The same software was used for independent sample T-test, with Leven's test for equality of variance, to identify possible differences between genders related to same age category with significance level set at p=0.05. To test the differences between the age groups, the analysis of variance (one-way ANOVA) with Bonferroni post-hoc test was used, and significance level was set at p=0.05. To calculate the BMI relative to age according to WHO and CDC, a Microsoft's Growth-Z excel workbook with possibility of batch calculation (Canadian Pediatric Endocrine Group, 2018) was used. For calculation of estimated

BMI according to IOTF references was LMS growth (version 2.77) used, through a Microsoft Excel add-in written using Excel 2000 with Visual Basic for Applications -VBA (Pan & Cole, 2012). Both, Growth-Z and LMS growth for calculation were based on LMS method. This method summarizes the changing distribution by three curves representing skewness (L), median (M) and coefficient of variation (S), for details about the method see: Cole and Green (1992). Nutritional status was

presented by percentages (%), and related to different references (WHO, CDC and IOTF) and their recommended cut-off points.

Results

Basic descriptive data (mean and standard deviation) for BH, BM and BMI classified by gender and age are presented in Table 2.

Table 2. Descriptive statistics for Girls and Boys relative to age

Age (years)	N	Girls			N	Boys		
		BH (cm) Mean±SD	BM (kg) Mean±SD	BMI (kg/m ²) Mean±SD		BH (cm) Mean±SD	BM (kg) Mean±SD	BMI (kg/m ²) Mean±SD
9	133	141.11±6.45	34.70±7.83	17.71±2.94	148	142.85±6.05	36.80±8.52	17.91±3.33
10	164	146.83±7.15	39.38±8.85	18.11±2.96	174	147.22±6.61	41.17±10.21	18.85±3.74
11	157	152.01±7.07	42.15±8.61	18.13±2.87	135	151.66±6.67	44.79±10.79	19.32±3.74
12	139	158.99±6.58	50.01±9.63	19.74±3.43	148	159.18±8.62	51.79±12.89	20.24±3.67
13	140	162.75±6.51	53.98±11.13	20.32±3.69	142	166.83±8.12	57.43±12.26	20.49±3.47
Total	733	152.25±10.22	43.93±11.51	18.70±3.37	747	153.26±11.18	46.16±13.21	19.33±3.71

Independent samples T-test on a whole sample for BH did not show significance ($t_{147.82}=1.81$, $p=0.070$), while boys were significantly heavier than girls by heaving 2.2 kg of mean difference (md) in BM ($t_{1457.69}=3.45$, $p<0.001$) and therefore had si-

gnificantly higher BMI than girls (md=0.64 kg/m², $t_{1469.44}=3.45$, $p<0.001$). The difference between the genders relative to age showed fluctuation in results (Table 3).

Table 3. Independent samples T-test results for total gender differences and for same age differences for Girls and Boys related to BH, BM and BMI

Age	Variable	t	Degree of freedom	Significance	Mean difference (Girls - Boys)
9	BH	-2.335	279	0.020*	-1.74 cm
	BM	-2.141	279	0.033*	-2.10 kg
	BMI	-1.614	279	0.108	-0.62 kg/m ²
10	BH	-0.524	336	0.601	-0.39 cm
	BM	-1.728	333.69	0.085	-1.80 kg
	BMI	-2.008	326.16	0.045*	-0.74 kg/m ²
11	BH	0.427	290	0.670	0.35 cm
	BM	-2.281	255.32	0.023*	-2.64 kg
	BMI	-2.999	249.08	0.003*	-1.19 kg/m ²
12	BH	-0.212	273.74	0.832	-0.19 cm
	BM	-1.332	271.59	0.184	-1.78 kg
	BMI	-1.185	285	0.237	-0.50 kg/m ²
13	BH	-4.662	268.77	0.001*	-4.08 cm
	BM	-2.475	278.14	0.014*	-3.45 kg
	BMI	-0.41	280	0.682	-0.18 kg/m ²
TOTAL	BH	-1.81	1470.82	0.070	-1.01 cm
	BM	-3.452	1457.69	0.001*	-2.23 kg
	BMI	-3.453	1469.45	0.001*	-0.64 kg/m ²

Legend: *significant difference at the 0.05 level

When compared within the group of 9 years of age, boys were heaving significantly higher BH ($t_{279}=2.34$, $p=0.020$, md=1.74 cm) and BM ($t_{279}=2.14$, $p=0.033$, md=2.10 kg) than girls, but without significant difference in case of BMI

($t_{279}=1.61$, $p=0.108$, md=0.62 kg/m²). In case of 10-years group, there were no significant differences between genders in BH ($t_{336}=0.42$, $p=0.678$) and BM ($t_{333.69}=1.63$, $p=0.103$), but BMI was significantly higher in boys ($t_{326.16}=2.01$, $p=0.045$,

md=0.74 kg/m²). Among the 11 years old children, there were no significant differences between boys and girls in BH ($t_{290}=0.43$, $p=0.670$), but boys had significantly higher BM ($t_{255.31}=2.281$, $p=0.023$, md=2.64 kg) and BMI ($t_{249.08}=2.99$, $p=0.003$, md=1.19 kg/m²). For 12-year groups there were no significant differences in any variable BH ($t_{273.74}=0.21$, $p=0.832$), BM ($t_{271.59}=1.33$, $p=0.184$) and BMI ($t=1.185$, $p=0.237$). However, for a 13-year group significant diffe-

rences occurred in two variables, whereby boys were having higher BH ($t_{268.77}=4.66$, $p<0.001$, md=4.08 cm) and BM ($t_{278.14}=2.47$, $p=0.014$, md=3.45 kg) but without significant differences related to BMI ($t=0.41$, $p=0.682$, md=0.18 kg/m²).

The results of Bonferroni post-hoc test showed significant differences ($p<0.05$) between all age groups in girls for BH (Table 4).

Table 4. Multiple comparisons related to age within same gender (Bonferroni post-hoc test)

Age group		Mean difference (A-B)			Mean difference (A-B)		
		Girls			Boys		
A	B	BH	BM	BMI	BH	BM	BMI
9	10	-5.718*	-4.675*	-0.82	-4.368*	-4.372*	-0.94
	11	-10.894*	-7.450*	-0.839	-8.806*	-7.988*	-1.409*
	12	-17.883*	-15.310*	-2.447*	-16.332*	-14.994*	-2.330*
	13	-21.637*	-19.276*	-3.022*	-23.977*	-20.628*	-2.582*
10	9	5.718*	4.675*	0.82	4.368*	4.372*	0.94
	11	-5.177*	-2.774	-0.019	-4.438*	-3.616*	-0.469
	12	-12.165*	-10.635*	-1.627*	-11.964*	-10.622*	-1.391*
	13	-15.920*	-14.601*	-2.202*	-19.609*	-16.256*	-1.642*
11	9	10.894*	7.450*	0.839	8.806*	7.988*	1.409*
	10	5.177*	2.774	0.019	4.438*	3.616*	0.469
	12	-6.989*	-7.860*	-1.608*	-7.526*	-7.006*	-0.922
	13	-10.743*	-11.827*	-2.183*	-15.171*	-12.640*	-1.173
12	9	17.883*	15.310*	2.447*	16.332*	14.994*	2.330*
	10	12.165*	10.635*	1.627*	11.964*	10.622*	1.391*
	11	6.989*	7.860*	1.608*	7.526*	7.006*	0.922
	13	-3.754*	-3.966*	-0.575	-7.645*	-5.634*	-0.252
13	9	21.637*	19.276*	3.022*	23.977*	20.628*	2.582*
	10	15.920*	14.601*	2.202*	19.609*	16.256*	1.642*
	11	10.743*	11.827*	2.183*	15.171*	12.640*	1.173
	12	3.754*	3.966*	0.575	7.645*	5.634*	0.252

Legend: * The mean difference is significant at the 0.05 level

Thirteen years old girls were 3.75 cm taller than 12 years old, 10.74 cm than 11 years old, 15.92 cm than 10 years old, and 21.64 cm than 9 years old girls. Furthermore, 13 years old girls were 3.97 kg heavier than 12 years old ($p=0.004$), 11.83 kg than 11 years old ($p<0.001$), 14.60 kg than 10 years old ($p<0.001$), and 19.28 kg than 9 years old ($p<0.001$). Only 11 years old girls did not significantly differ from 10 years old (md=2.77 kg, $p=0.075$). However, significant differences in BMI for 13-year group were found with 11-year (md=2.18 kg/m², $p<0.001$), 10-year (md=2.20 kg/m², $p<0.001$) and 9-year group (md=3.02 kg/m², $p<0.001$), but without significant differences with 12-year group (md=0.57 kg/m², $p=1.00$). Significant differences were not found between 11, 10 and 9-year group of girls. On the other side, Bonferroni post-hoc test showed statistically significant ($p<0.05$)

differences between all age groups in boys in BH and BM variables (Table 4). Thirteen years old boys were 7.64 cm taller than 12 years old, 15.17 cm than 11 years old, 19.61 cm than 10 years old, and 23.98 cm than 9 years old boys. A gradual increase in BH was followed by the same trend ($p<0.05$) in BM, whereby 13 years old boys were 5.63 kg than 12 years old, 12.64 kg than 11 years old, 16.26 kg than 10 years old, and 20.63 kg than 9 years old boys. In case of BMI 13-years old boys had significantly higher BMI than 10 years old ($p=0.001$), and 9 years old ($p<0.001$), but without significant differences compared to 12 years old ($p=1.00$), and 11 years old boys ($p=0.069$). Through the text were emphasized just the most relevant data, but for details about multiple comparisons consult Table 4.

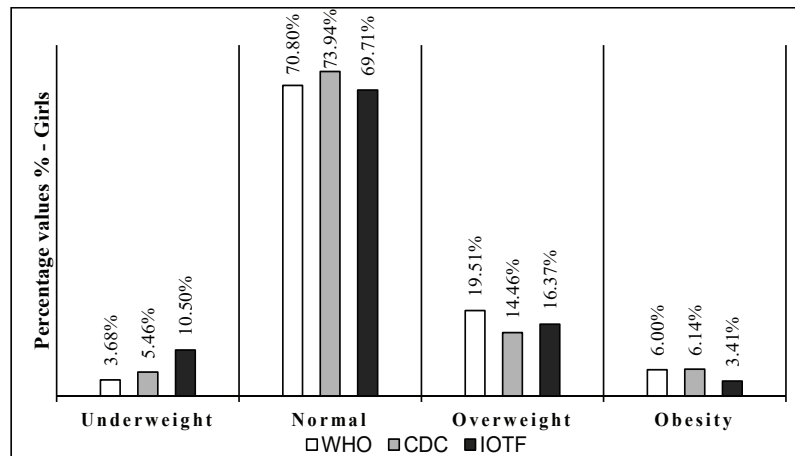


Figure 1. Nutritional status according to different references (WHO, CDC and IOTF) for Girls (9-13 yr.)

The results of relative prevalence of nutritional status in particular categories (Table 1) according to WHO, CDC and IOTF is presented graphically for girls (Figure 1) and boys (Figure 2).

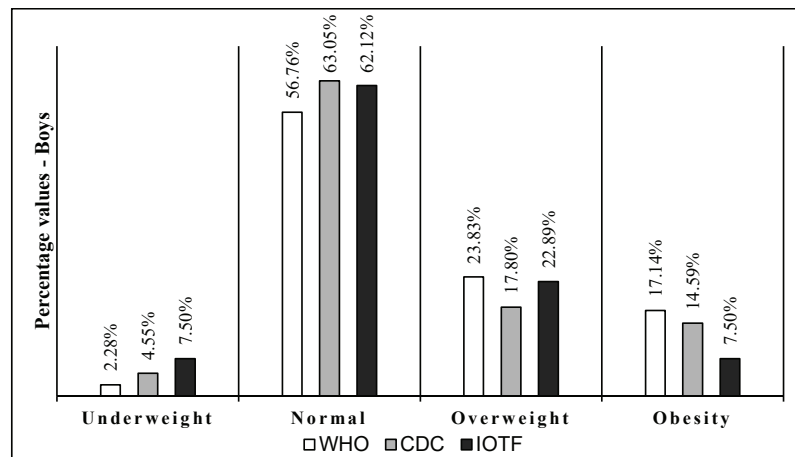


Figure 2. Nutritional status according to different references (WHO, CDC and IOTF) for Boys (9-13 yr.)

According to WHO, prevalence of underweight was lower than in CDC and IOTF and higher in overweight regardless of gender, while according to CDC, prevalence of normal was higher comparing to WHO and IOTF but the lowest in overweight category in both, boys and girls. Pre-

valence of underweight was the highest according to IOTF, with prevalence of obese being the lowest in girls as well as in boys. It seems that there was no specific trend of changes in prevalence of nutritional status relative to age (Table 5).

Table 5. Nutritional status according to different references (WHO, CDC and IOTF) and related to age and sex

Age		Girls					Boys					Total
		9	10	11	12	13	9	10	11	12	13	
WHO (%)	Underweight	5.26	3.03	4.49	1.44	2.86	6.08	1.15	0.74	1.35	2.11	2.97
	Normal	69.17	67.88	75.64	69.06	72.14	52.70	59.20	56.30	56.08	59.15	63.72
	Overweight	17.29	22.42	15.38	23.02	19.29	21.62	18.97	25.19	28.38	26.06	21.69
	Obesity	8.27	6.67	3.21	6.47	5.71	19.59	20.69	17.78	14.19	12.68	11.62
CDC (%)	Underweight	8.27	6.06	7.69	3.60	5.00	7.43	3.45	4.44	2.70	4.93	5.34
	Normal	69.17	72.73	79.49	71.94	75.71	60.14	64.94	62.96	61.49	65.49	68.45
	Overweight	16.54	14.55	10.26	17.99	13.57	17.57	14.37	16.30	23.65	17.61	16.15
	Obesity	6.02	6.67	2.56	6.47	5.71	14.86	17.24	16.30	12.16	11.97	10.07
IOTF (%)	Underweight	13.53	9.70	11.54	7.91	10.00	10.14	7.47	7.41	5.41	7.04	8.99
	Normal	63.91	69.09	75.64	67.63	71.43	59.46	62.07	62.96	62.16	64.08	65.88
	Overweight	18.05	18.18	12.18	19.42	14.29	22.30	21.26	20.74	25.00	25.35	19.66
	Obesity	4.51	3.03	0.64	5.04	4.29	8.11	9.20	8.89	7.43	3.52	5.47

Discussion

This study evaluated the nutritional status of children in Montenegro through three different references. They all differ in the results related to prevalence by defined categories in a more or lesser extent (Figure 1 and 2, and Table 3), which is similar to results from previous studies (Shan et al., 2010; Wang & Chen, 2012; Martinovic et al., 2015; Jaksic et al., 2017). Following only BMI values relative to any of used references showed inconsistency but when BMI results were consolidated with age and gender-related differences in BH and BM, it indicated that BMI may vary due to the laws related to growth and maturation of boys and girls. In that regards, the question of applicability and reliability, and which reference is the most suitable for the school population in Montenegro needs a further research, including another measures of body composition, such as body fat, waist circumference, waist to height ratio, muscle mass (Sharma, Metzger, Daymont, Hadjiyannakis, & Rodd 2015; Schroder et al., 2014). The reasons for this could lie in a specificity of morphology related to geographical position and genetic heritage in Montenegro (Grasgruber et al., 2017). Therefore, IOTF reference seems as the most appropriate method because it bears more biological meaning comparing to distribution-based CDC and WHO references (Wang & Chan, 2012; Cole, Bellizzi, Flegal, & Dietz, 2000).

Three used reference values were constructed on samples before the global epidemic of obesity, while WHO and CDC references included only North America (Wang & Chen, 2012). In contrast, IOTF references included the population from different regions in the world (Brazil, Great Britain, Netherlands, Hong Kong, Singapore and United States) and was based on sex-age-specific BMI values obtained at 18 years. Although analyzed many countries, study of Cole et al. (2000) did not include Eastern Europe (especially Dinaric Alps) which was shown to be different in physical stature (Grasgruber et al., 2017). The information obtained in this study are certainly useful, informative and relevant for comparison with global trends in nutritional status. However, developing a national growth-age-sex-stature independent indicator of nutritional status such as waist-to-height ratio would probably be the best way for the future monitoring and prevention of negative trends in nutritional status of schoolchildren in Montenegro.

Considering the prevalence defined by nutritional categories, the differences were present in relation to both, gender and age. According to all three used references (WHO, CDC and IOTF) prevalence of overweight and obesity was higher among boys than among girls, whereby WHO overestimated number of overweight and obese in both groups, followed by CDC and IOTF (see Figures 1 and 2). Conversely, WHO underestimated the number of underweight children in both gender groups and all age groups, followed again by CDC and then IOTF (See Figures 1 and 2). This additionally suggest that IOTF as a sex-age-specific reference may be more accurate than other two used in this study. In terms of overweight and obesity, the situation is alarming, because boys were more overweight and obese than girls of same age and in total, which supports the findings of Martinovic et al. (2015). On the other side, a comprehensive study from Ng et al. (2014), which showed that prevalence of overweight and obese children in Montenegro were 26.3% and 9.4%, for boys and 27.3% and 8.3% for girls does not support the findings of the present study. The reason for concern may be raised because present study showed

increase in number of obese boys comparing to prevalence of obesity from Ng et al. (2014), in each of used references as well as a big disbalance comparing to girls. Prevalence results from Martinovic et al. (2015) further support this notation because they used the same methodology as in the present study but the prevalence of obese was lower. In the short period of time (5 years) prevalence of overweight and obese boys increased in all three references: according to WHO criteria number of overweight and obese is increased by 8.7%, according to CDC for 3%, and according to IOTF for 3.9%. A small increase in prevalence of overweight and obese of 3.9% by WHO criteria, 1% by CDC, and 0.7% by IOTF could be also noticed among girls.

It could be concluded that the increase in boys was relatively high considering the time frame, while increase in girls was somewhat smaller, but nevertheless present. In total prevalence of overweight and obese among Montenegrin children increased according to all three used methods, among which the biggest increase occurred according to WHO reference (6.3%), followed by IOTF (2.2%), and CDC (1.7%). Roughly speaking, of 100 children, 6 would be underweight, 61 would be normal weight, and 33 would be overweight or obese. In other words, every third (WHO) or every fourth (CDC and IOTF) child in Montenegro aged 9-13 years is either overweight or obese.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Evaluating Dancers' Participation Motives: The Use of the Greek Version of the BRSQ

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Abstract

The study's aim was to cross-validate the "Behavioral Regulation in Sport Questionnaire" (BRSQ), of Lonsdale and his co-authors (2008) in a Greek dance context. The sample consisted of 390 dancers, 249 coming from folk dance groups and 141 from non-folkdance groups. The scale was translated into Greek using the back-translation procedure. The validity and reliability of the questionnaire were checked by performing a confirmatory factor analysis (CFA) and an internal consistency analysis using Cronbach's alpha. Descriptive statistics were calculated to broadly examine the participation motives and Independent samples t-test calculated the differences in the participants' motives according to the kind of dance they chose to participate in. The Greek version of BRSQ showed stable psychometric properties. Intrinsic motivation is highly evaluated by both traditional and modern/classic dance participants, though the participants of different types of dances statistically different evaluate some of their intrinsic and extrinsic motives of participation.

Key words: traditional dance, modern and classic dance, motivation, participants, BRSQ

Introduction

Dance, as an expression of human behavior, always fascinated people no matter of their age, sex or social tax. It has always been an integral part of both the daily and the festive life of humans (Deagon, 2008), and it has evolved into a highly cultural and recreational form of expression. Nowadays, dance is considered to be a pleasant and effective form of physical and recreational activity (Goulimaris, Mavridis, Genti, & Rokka, 2014), and for this reason it attracts many participants (Goulimaris, 2016). It offers both physiological and psychological benefits and, most importantly, it can be performed anywhere and at any time, without the use of any specific equipment (Judge, 2003). Researchers (Bennet & Hackney, 2018; Kaltsatou, Kouidi, Anifanti, Douka, & Deligiannis, 2014; Mavrovouniotis, Argiriadou, & Papaioannou, 2010; Rokka, Mavridis, Mavridou, Kelepouris, & Filippou, 2015; Rudolph et al., 2018), proved that as dance combines movement, social interaction and fun, it motivates participation in general, either for healthy people of all ages and for patients taking part in training programs.

Measuring and understanding consumers' motivation is of extreme importance as it helps organizations to implement any type of system aiming to improve process efficiency and efficacy, seek competitive advantage, build a brand identity and secure customer retention (Alexandris, 2012; Gonzalez, Tomas, Castillo, Duda, & Balaguer, 2017; Mehmeti & Halilaj, 2018; Tsitskari, Tzetzis, & Konsoulas, 2017). Customer retention is one of the most important issues facing leisure managers, as it requires detailed knowledge of behavioral aspects of customers' decision-making process (Tsitskari et al., 2017), such as of their motives.

Literature on exercise motivation indicates that its conceptualization and measurement are not yet clear issues. Different theoretical approaches have been used and, as a result, a variety of measurement models have been proposed (Lonsdale, Hodge & Rose, 2008; Mallet, Kawabata, Newcombe, Otero-Forero, & Jackson, 2007; Pelletier, Fortier, Vallerand, Tuson, & Blais, 1995). This might also be related to the heterogeneity of exercise participants and the different exercise environments worldwide. Naturally, this heterogeneity exists in



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the evaluation of dancers' motivation, as well (Goulimaris, Filippou, & Koupani, 2016; Filippou, Rokka, & Mavridis, 2016). Self-determination theory (Deci & Ryan, 2000) has been prominent in conceptualizing all types of sport motivation in terms of a qualitative continuum. The most basic distinction that its researchers proposed was that of intrinsic motivation (absence of external rewards), extrinsic motivation (external rewards), and amotivation (Deci & Ryan, 2000).

Intrinsic motivation refers to doing an activity for the pleasure deriving from participating in it, with a complete absence of external rewards (Deci & Ryan, 2000). Consequently, all choices taken when a person is intrinsically motivated involve a great sense of freedom. Extrinsic motivation refers to taking part in an activity for external rewards (Deci & Ryan, 2000) and separable outcomes, to avoid punishment or satisfy an external demand (Lonsdale et al., 2008). Finally, amotivation (Ryan & Deci, 2000), is the state of lacking an intention to act. In the sporting context, for example, amotivated athletes are likely to question the continuation of their participation (Lonsdale et al., 2008). To examine intrinsic motivation, extrinsic motivation and amotivation, following the principles of SDT in a dance participation context, a conceptually and psychometrically sound measure of behavioral regulation is essential.

Lonsdale and his cooperates (2008) offered to the research community such a scale, comprised of 36 items evaluating amotivation, intrinsic and extrinsic motivation through nine types/factors of motivation: i) One for amotivation, ii) four for intrinsic motivation (IM-General, IM to know, IM to experience

stimulation and IM towards accomplishments) and iii) four for extrinsic motivation (Integrated, Identified, Introjected and External regulation). Each factor was evaluated through four items. The researchers named the tool "Behavioral Regulation in Sport Questionnaire (BRSQ)". The evidence that Lonsdale and his cooperates (2008) presented was supportive of the reliability and validity of the BRSQ scores. The scale has already been used in a Greek sample of young sport participants by Tsitskari, Vernadakis, Foridou and Bebetos (2015), though the translated scale did not support the hypothesized dimensionality of the original one. After confirmatory and exploratory factor analyses, a six-factor solution resulted, that closely reproduced three of the motivational factors of the initial Australian version of BRSQ (Lonsdale et al., 2008).

The aim of the present study was to examine the factorial structure and validity of BRSQ in a sample of dancers participating in Greek traditional dance and classic and modern dance lessons. Moreover, the possible differences among the different dances' participants were also examined.

Methods

Participants

The sample of the study consisted of 390 dancers, recruited from ten groups offering lessons of Greek traditional dances (249 participants) and six schools offering classic and modern dance's lessons (141 participants). The samples' demographics appear in Table 1.

Table 1. Sample's Demographic characteristic

Gender (%)		Age (%)		Dance (%)	
Male	22.8	15-18	37.4	Greek Traditional	63.8
Female	77.2	19-29	23.8	Non-traditional (modern & classical dances)	36.2
		30-39	18.5		
		40-49	14.4		
		>50	5.9		

Instruments

As the first Greek version of BRSQ (Tsitskari et al., 2015) didn't support the original's hypothesized dimensionality, the researchers decided to once again use the original scale and test it in a sample of Greek dancers. Although BRSQ was specifically designed for use with competitive sport participants (Lonsdale et al., 2008), the researchers believe that it will fit well in a less competitive environment as such of traditional and non-traditional dances' lessons.

The original scale consisted of 36 items, comprised in nine factors of motivation, the following: i) Amotivation, with 4 items, e.g. "...but I question why I continue", ii) External regulation, with 4 items, e.g. "...because if I don't participate other people will not be pleased with me", iii) Introjected regulation, with 4 items, e.g. "...because I would feel guilty if I quit", iv) Identified regulation, with 4 items, e.g. "...because it's a good way to learn things which could be useful to me in my life", v) Integrated regulation, with 4 items, e.g. "...because it's an opportunity for me to be just who I am", vi) IM-general, with 4 items, e.g. "...because I enjoy participating in dance classes", vii) IM-Know, with 4 items, e.g. "...because I enjoy learning new things about dance", viii) IM experience Stimulation, with 4 items, e.g. "...because of the pleasure I experience when I feel

completely absorbed in dance", and ix) IM to accomplish, with 4 items, e.g. "...because I enjoy doing something to the best of my ability". All answers were given in a seven-point Likert type scale ranging from 1=totally disagree to 7=totally agree.

The back-translation technique was used to translate the BRSQ scale. Two researchers translated the original BRSQ into Greek and afterwards compared the two versions. 29 out of the 36 items were translated in an almost identical way. For the remaining 7, the two researchers discussed the results and concluded that its meaning was quite identical, despite the use of different words. In each case, the translators came to an agreement to keep one of the two statements, which seemed to be the more appropriate one according to the vocabulary used, the meaning, the grammar and syntax. The Greek version was then given to two other bilingual researchers in the field of sport marketing and psychology who agreed to translate the items back into English. Neither of the two researchers had ever used the BRSQ. After the translation was accomplished, the four researchers evaluated the back-translated versions with the original Questionnaire. While some of the statements (22 out of 36) were slightly not identical to those of the original scale, the researchers agreed that their meaning was the same and decided to retain the translated Greek scale.

To check the content validity of the questionnaire a pilot study was carried out, in which 80 traditional dancers and 40 modern dance participants. The questionnaires were filled in and the respondents didn't report any difficulty in the comprehension and the fill in of the questionnaire.

Procedure

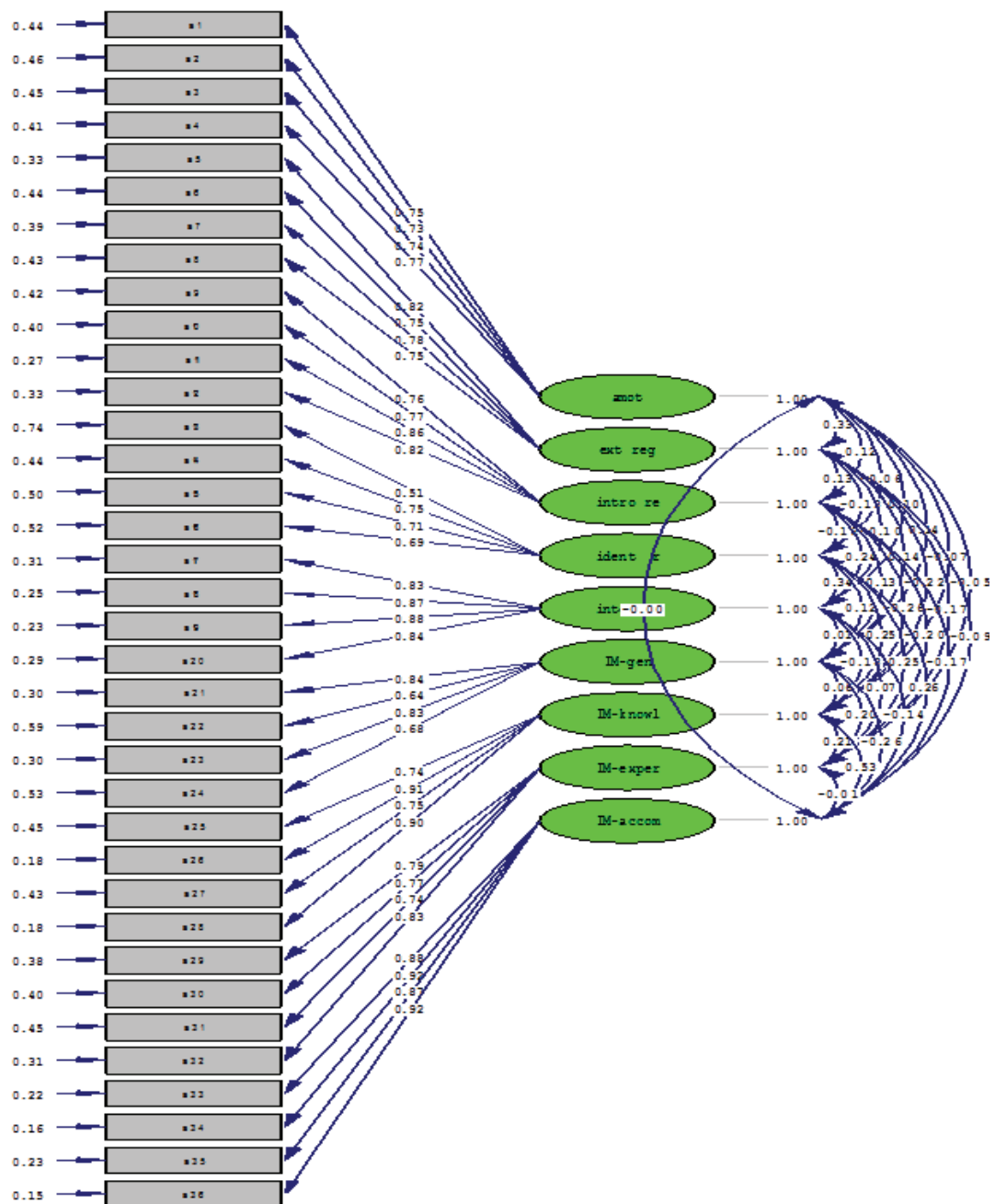
Data were collected from October to December of 2017. Prior contact with teachers or owners/managers of traditional and modern/classic dances was made to obtain permission. The questionnaires were given to the dancers by one of the researchers before the beginning of the lesson to avoid fatigue or even sentimental responses (eg. after a good or bad day on the lesson). A total of 435 questionnaires were distributed, 397 were returned, of which, eventually, 390 were used in the study (return rate: 89.66%).

Data analysis

Questionnaire's validity and reliability were checked by performing a confirmatory factor analysis (CFA), an internal consistency analysis using Cronbach's alpha. Independent Samples T-test was performed to examine the possible differences on participants' motives according to the type of dance.

Results

A confirmatory factor analysis was performed through LISREL 8.80 on the nine subscales of the BRSQ. The hypothesized model is presented in figure 1 where ellipses represent latent variables and rectangles represent measured variables. Figure 1 shows the path diagram for the latent and observed variables.



Chi-Square=1528.31, df=558, p-value=0.00 000, RMSEA=0.067

Figure 1. Path diagram of the latent on the observed variables

The hypothesized model consists of eight latent variables, namely amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, IM-general,

IM-Knowledge, IM-experience stimulation, and IM-accomplish. The observed items on the BRSQ and their corresponding questions and subscales (factors) are presented in Table 2.

Table 2. Standardized direct effects of the latent on the observed variables

Items	Factors								
	L1	L2	L3	L4	L5	L6	L7	L8	L9
1	.75								
2	.73								
3	.74								
4	.77								
5		.82							
6		.75							
7		.78							
8		.75							
9			.76						
10			.77						
11			.86						
12			.82						
13				.51					
14				.75					
15				.71					
16				.69					
17					.83				
18					.87				
19					.88				
20					.84				
21						.84			
22						.64			
23						.83			
24						.68			
25							.74		
26							.91		
27							.75		
28							.90		
29								.79	
30								.77	
31								.74	
32								.83	
33									.88
34									.92
35									.87
36									.92

Legend: L1: amotivation, L2: external regulation, L3: introjected regulation, L4: identified regulation, L5: integrated regulation, L6: IM-general, L7: IM-Knowledge, L8: IM-experience stimulation, L9: IM-accomplish

The fit indices taken into consideration were: namely minimum discrepancy (CMIN or χ^2), degrees of freedom (d.f.), minimum discrepancy divided by the degrees of freedom ($\chi^2/\text{d.f.}$), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and incremental indices Comparative Fit Index (CFI), Normed Fit Index (NFI) (Bagozzi, 1983; Banville, Desrochers, & Genet-Vo-

let, 2000; Hu & Bentler, 1999). The results of the confirmatory factor analysis demonstrated that the hypothesized model produced a significant chi-square, $\chi^2 (390, 558)=1528.31$, $p<0.05$. The NFI and CFI were found to be 0.92 and 0.93 respectively. The RMSEA was also considered to assess the degree of fit of the model. The RMSEA value for the hypothesized model was found to be .067 and SRMR=0.044 (Table 3).

Table 3. Model Fit Indices

	N	CMIN	DF	NFI	CFI	RMSEA	SRMR
Model	390	1528.31	558	.92	.93	.067	.044

Reliability analysis

The values for alpha of Cronbach were calculated to assess the internal consistency reliabilities of the scale (0.84) and its emerged sub-scales: i) 0.84 for IM-General, ii) 0.94 for IM-Stimulation, iii) 0.90 for the IM-Know, iv) .86 for the IM-accomplish, v) 0.92 for Integrated Regulation, vi) 0.88 for Introjected Regulation, vii) .86 for External Regulation, viii) 0.76 for Identified Regulation and ix) 0.84 for Amotivation (Table 4).

Evaluating the Motives when Participating in Dancing Activities

As it becomes evident in Table 4, the factors "IM-general", "IM-accomplish" and "IM-knowledge" are experienced with the most considerable tension followed by "IM-experience stimulation" and "Integrated regulation". The factors "Amotivation" and "Introjected regulation" showed the lowest value.

Table 4. Means, Standard Deviations and Cronbach's α of the Intrinsic, Extrinsic and Amotivation Factors evaluated by the sample's dancers

	Factors	M	SD	Cronbach's α
1	IM-general	5.88	.83	.84
2	IM- accomplish	5.34	.76	.86
3	IM-know	5.10	.91	.90
4	IM- experience stimulation	4.66	1.14	.94
5	Integrated regulation	4.50	1.09	.92
6	Identified regulation	4.39	.74	.76
7	External regulation	2.72	.91	.86
8	Introjected regulation	1.96	.68	.88
9	Amotivation	1.75	.68	.84

Evaluating the participants' Motives according to the type of Dance they participate in

Independent samples T-test was conducted to indicate any differences in kind of dance and participants motives. Results revealed significant statistical differences in the following subscales:

i. **"IM-general"** $t(388)=17.94$, $p<0.00$: dancers of traditional dance ($M=6.25$, $SD=0.58$) more positively evaluated this factor than participants of non-traditional dance ($M=5.21$, $SD=0.79$).

ii. **"IM-experience stimulation"** $t(388)=-4.40$, $p<0.00$: dancers of non-traditional dances ($M=4.99$, $SD=0.76$) more positively evaluated this motives than participants of traditional dances ($M=4.47$, $SD=1.28$).

iii. **"Integrated regulation"** $t(388)=-4.14$, $p<0.00$: dancers of non-traditional dances ($M=4.79$, $SD=0.67$) more positively evaluated this motivational factor than dancers of traditional dance ($M=4.33$, $SD=1.24$).

iv. **"Identified regulation"** $F(1,389)=6.24$, $p<0.013$: dancers of non-traditional dances ($M=4.52$, $SD=0.69$) more positively evaluated this factor than participants of traditional dances ($M=4.31$, $SD=0.77$).

Discussion

In study, we examined perceptual and motor performances between fencers and non-fencers during a reaching task with a choice reaction time (RT) condition. The variables depicting the perceptual (RT) and motor performances (accuracy and movement speed) were analyzed. In all those variables, fencers displayed better performances compared to non-fencers. That is, fencers performed the reaching task with better RT, less final position error, and faster movements compared to non-fencers.

Superior performance of fencers compared to non-fencers was observed in many tasks. For instance, greater performance of the right arm in fencers over non-fencers has been reported for discriminative reaction time tasks (Chan et al., 2011; Di Russo et al., 2006). In their study, Chan et al. (2011) concluded that the combination of physical fitness and level of expertise

get more benefit for cognitive control mechanism compared to when each of them applied singly. In the current study, we also found that fencers have better perceptual performance compared to non-fencers. Both cognitive and perceptual skills are acquired through training, and the long-term participation of training required to attain high level of skill makes the component processes mainly automatic (Logan, 1988). Thus, expert skills are often flexible, so they can be utilized in various task contexts (MacKay, 1982), like what was observed in the current study. In another study, Williams and Walmsley (2000) introduced recordings of EMG activity during measurement of response times between elite fencers and novice subjects. They have found that elite fencers displayed more coherent muscle synergies and more consistent pattern of muscle coordination than novice subjects. Thus, more coherent muscle synergies for fencers may lead to have fewer errors than non-fencers, which was observed in the current study. We have also found that fencers' reaches were significantly faster than non-fencers. It has been previously found that fencers were faster than non-fencers in movements of the upper limbs (Roi & Bianchedi, 2008); thus, our finding on reaching movement speed is in agreement with that previous study result. Participation of long-term practice may lead the fencers to develop this skill over the time. In addition, as they mainly practice fast pointing movements in their exercise settings, this can lead them to have faster movements than non-fencers. In fact these results are not in agreement with speed accuracy trade-off proposed by Fitts (1954). As we stated earlier, Fitts stated that when the movement velocity increased, the errors in the aiming movements increased as well. This trend was not observed for the fencer. The speed accuracy trade-off has been an interesting topic for researchers especially focusing on choice RT tasks (Bogac, Wagenmakers, Forstmann, & Nieuwenhuis, 2010). This phenomenon is also very important for the sports performance. For instance, Freeston and Rooney (2014) conducted a study with baseball and cricket players to determine the speed that optimizes accuracy in a throwing task. They found that speed accuracy trade-off was worse for the cricket players compared to baseball players. Thus, even though these two sports seem to be similar

in many ways, they do not show the similar pattern in motor performance. In our study, fencers showed faster reaches with significantly less errors compared to non-fencers. Thus, speed accuracy trade-off is not predetermined entity and can be modified by long-term sport participation. It has been also previously stated that the classical Fitts' law can be violated in tasks that involve a ballistic component (Juras, Slomka, & Latash, 2009). In this study, we compared fencers and non-fencers in the same task that can include a ballistic component, and fencers showed a different pattern compared to non-fencers and violated the speed accuracy trade-off. In conclusion, although we do not know if the fencers had already superior perceptual and motor skill capabilities before they started fencing, we can point that this sport requires high perceptual and motor skill requirement. Moreover, fencers can control better the speed accuracy trade-off, and thus the phenomenon cannot be valid for some groups.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Shooting Ball Accuracy with U16 Soccer Players after Preparation Period

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Abstract

The main aim of the research was to identify a level of quantitative changes of the shooting ball accuracy with U16 soccer players under the influence of the programmed soccer training of six weeks a summer preparation period. The training programme covered 44 training units. The research was made on a sample of 120 soccer players. For the assessment of shooting ball accuracy the three tests were used: Straight foot accuracy in the vertical target, Elevation foot accuracy in the vertical target and Elevation head accuracy in the vertical target. In the area of comparative statistics, used t-test for big paired samples. Based on the numerical values of the t-test it can be concluded that there are statistically significant differences in all three variables to estimate the shooting ball accuracy. In this research the authors were guided by the fact that this kind of training program in preparation period, where dominates the situational model training is very effective in terms of raising the shooting ball accuracy with U16 soccer players, because the model that is used in this training period abounds in exercises in which dominates the shooting ball accuracy, in straight and elevation line. The obtained results can be directed towards innovation plans and programs in the preparation period, and the adaptation of the same needs of the respective population.

Key words: soccer, soccer players, preparation period, shooting ball accuracy

Introduction

Soccer is the most popular sport in the world, with close to 270 million participants (Akbari, Sahebozamani, Daneshjoo, & Amiri-Khorasani, 2018). Soccer is a sport that is characterized by numerous and varied complex dynamic kinesiology activities that are characterized by a large number of cyclic and acyclic movements (Gardasevic, Bjelica, & Vasiljevic, 2017; Sermahhaj, Popovic, Bjelica, Gardasevic, & Arifi, 2017). Soccer consists of various types of movements and actions like tackling, jumping, sprinting and kicking (Reilly, Williams, Nevill, & Franks, 2000; Amiri-Khorasani, Osman, & Yusof, 2009). The high specificity of loading, decision making under pressure of opponents (Hulka, & Weisser, 2017) in all four moments of play, possession of the ball, the opponent's possession of it, the transformation after winning the ball and the transformation after losing the ball depends on the ability of players to perform certain movements of varying intensity, in different directions and the different sections of the field (Gardasevic, Bjelica, & Corluka, 2018a; Gardasevic, Bjelica, &

Corluka, 2018b). They must have developed basic and specific motor abilities (Gardasevic, & Vasiljevic, 2017). Level of adaptations and time to reach at degree of adaptation according to training objectives are determining type of training which coaches may choose (Amani, Sadeghi, & Afsharnezhad, 2018). One of the specific motor skills, which should be at a high level, is a shooting ball accuracy.

The shooting ball accuracy is considered as the very important ability of the soccer player. A good soccer player is the one who is able to perform complex situational-motor actions coordinated in a certain space and in time period as short as possible and with good shooting ball accuracy (Corluka et al., 2018).

The main objective of this study was to determine the level of quantitative changes of the shooting ball accuracy with U16 soccer players, under the influence of a programmed soccer training which included one preparatory period of forty-two days.



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Methods

This was a longitudinal study with an aim that in the two time-varying points determine quantitative changes of the shooting ball accuracy in soccer players (15 years \pm 6 months) under the influence of programmed training process, which included a summer preparation period for the competition season in a unique cadet league of Montenegro and the cadet league middle region of Montenegro. The training program lasted 42 days and was carried out on the auxiliary soccer field of FC Sutjeska-Niksic. The training program included 44 trainer units, within which 8 friendly matches were played.

For data processing only the results of those respondents who have undergone a complete program of work and who have joined the initial and final measurement are taken. This study included a sample of 120 young cadet soccer players of 4 teams, all from Niksic. Parents of all participants signed a consent form, which was in accordance with the Helsinki Declaration. Before programmed work all respondents had passed medical check-ups to make sure they could access the training process. When selecting the instruments (tests) it was taken into account that they meet the basic metric characteristics, which means the appropriate age and objective material and spatial conditions. For the assessment of the shooting ball accuracy, the following tests were used: 1. Straight foot accuracy in the vertical target; 2. Elevation foot accuracy in the vertical target; 3. Elevation head accuracy in the vertical target.

Straight foot accuracy in the vertical target is performed in an open or closed space of minimum dimensions of 30 x 5 meters. The participant stands with a ball 25 meters from the goal. He leads the ball 5 meters with two touches and shoots it on goal from 20 meters away from the goal. The participant has 10 knocks on the goal. Points are: hit the central goal (the goal is 1.5 m wide)=3 points; hit the goal from the side (the goals are 1 m wide)=2 points; hit above and beside goal=1 point.

Elevation foot accuracy in the vertical target is performed on the football field. The participant stands with a ball 30 meters from the goal. He leads the ball 5 meters with two touches and shoots it on goal from 20 meters away from the goal. The participant has 10 knocks on the goal. Points are: hit the goal that the ball does not reach the ground in its path=3 points; hit in the goal frame that the ball does not reach the ground in its path =2 points; hit above and beside goal=1 point; if the ball on its way reaches the ground before entering the goal=1 point.

Elevation head accuracy in the vertical target is performed in an open or closed space of minimum dimensions of 15 x 5 meters. The participant stands with a ball 15 meters from the goal. He leads the ball 5 meters his head with two touches and shoots it on goal his head from 10 meters away from the goal. The participant has 10 knocks on the goal. Points are: hit the goal that the ball does not reach the ground in its path=5 points; hit the goal that the ball has one touch the ground in its path=3 points; hit in the goal frame and missed the goal=1 point; hit above and beside goal=1 point; if the ball on its way reaches the ground before entering the goal=1 point.

Considering that these are cadet age players (15-years \pm 6 months), in a sensitive period of psychophysical development, program is tailored specifically to their age, taking into account the time spent in the previous training process. Time structure

of the training ranged from 60 to 120 minutes, depending on the goals and objectives of the training unit and it was divided into 3 phases: 1. Introductory-preparatory part (25-30% of the duration of training); 2. The main part (60-65% of the duration of the training); 3. The final part (up to 10% of the duration of training)

In the introductory-preparatory part of the training the emphasis was on raising the operating temperature in children. As a tool, various elementary games with a ball were used that enabled work on the elementary basics of technique and tactics, also the various polygons with exercises the shooting ball accuracy were used. A variety of games and exercises to increase joint mobility and strengthen muscles also applied at this stage.

At the first stage of the main part of the training the intensity is slightly increased compared to the warm-up phase and the training program was implemented through a variety of ball games. With a game method, the respondents were taught and practiced soccer skills through a large number of repetitions. At the second stage of the main part of the training the players mostly had a free game on two goals that allowed them creative activities and highlight of individual, imagination, independent thinking and hard work, applying the elements that teach by the method of the game from the first stage of the main part, and thus strengthening the willing quality. At this stage of the training the intensity was the greatest. At the final part of the training the task was lowering the physiological curve to an optimum level, and low-intensity activities were used: stretching and relaxation exercises, competitive game of penalty kicks, free kicks.

Data obtained from the survey were analysed using descriptive and comparative statistics. In the area of descriptive statistics for each variable both in the initial and the final state central and dispersion parameters were processed as well as measures of asymmetry and flatness. The hypothesis of normal distribution of results was tested on the basis of Kolmogorov and Smirnov test. In the area of comparative statistics, to determine differences in the variables used to estimate the shooting ball accuracy at the start (initial state) and at the end (final state) of the training program in the preparation period, we used the discriminative parametric procedure Student's t-test for large dependent samples.

Results

In Tables 1 and 2 are shown the basic descriptive statistical parameters of variables for estimations of the shooting ball accuracy in the initial and final measurement, where the values of central and dispersion tendency were calculated: arithmetic mean (Mean), standard deviation (Std.D.), standard error of arithmetic mean (Std.E.), the coefficient of variation (CV%), minimum (Min) and maximum (Max) values, the range of results (Range), the curvature coefficient Skewness (Skew) and elongation Kurtosis (Kurt), as well as the values of Kolmogorov and Smirnov test (K-S).

First the central and dispersive parameters of variables for assessing the shooting ball accuracy in the initial state were analysed (Table 1).

Table 1. Central and dispersive parameters of variables for assessing the shooting ball accuracy in the initial state

No	Variable	Mean	Std.D.	Std.E.	CV%	Min	Max	Range	Skew	Kurt	K-S
1	SFAVTI	19.76	3.24	0.30	16.38	10	26	16	-0.50	0.04	0.05
2	EFAVTI	32.33	3.35	0.31	10.37	26	38	12	-0.18	-0.78	0.00*
3	EHAVTI	19.54	4.11	0.37	21.01	9	27	18	-0.64	0.25	0.26

Legend: SFAVTI-straight foot accuracy in the vertical target-initial state; EFAVTI-elevation foot accuracy in the vertical target-initial state; EHAVTI-elevation head accuracy in the vertical target-initial state

By analysing the central and dispersion parameters of variables for assessing the shooting ball accuracy in the initial state-values of Kolmogorov and Smirnov test shows that the results in the variable EFAVTI-elevation foot accuracy in the vertical target, have statistically significantly deviation from the normal distribution. For the other two variables for as-

ssing the shooting ball accuracy - it can be seen that the range of results is quite large.

Central and dispersive parameters of variables for estimation of the shooting ball accuracy in the final measurement showed the following values (Table 2).

Table 2. Central and dispersive parameters of variables for assessing the shooting ball accuracy in the final state

No	Variable	Mean	Std.D.	Std.E.	CV%	Min	Max	Range	Skew	Kurt	K-S
1	SFAVTF	23.30	2.52	0.23	10.81	15	27	12	-0.67	-0.07	0.00*
2	EFAVTF	41.40	3.38	0.31	8.16	36	48	12	0.14	-0.91	0.02
3	EHAVTF	27.45	4.42	0.40	16.08	15	36	21	-0.56	0.54	0.20

Legend: SFAVTF-straight foot accuracy in the vertical target-final state; EFAVTF-elevation foot accuracy in the vertical target-final state; EHAVTF-elevation head accuracy in the vertical target-final state

By analysing the central and dispersive parameters of variables for estimation of the shooting ball accuracy in the final stage-it may be noted that the values of arithmetic means are in all three variables at a higher level than in the initial state. The values of Kolmogorov and Smirnov test shows that the results in the variable SFAVTF-straight foot accuracy in the vertical target, have statistically significantly deviation from the normal distribution. These results show how that the shooting ball accuracy is complicated for U16 soccer players.

To determine the statistical significance of differences in arithmetic means (partial quantitative changes) of variables for estimation of the shooting ball accuracy, the t-test was applied to for large dependent samples. The values of t-test were on the level of significance (Sig.) from 0.01 ($p \leq 0.01$) in all the variables for the evaluation of the shooting ball accuracy. The differences of arithmetic means of the initial and the final measurement of variables for evaluating the shooting ball accuracy are shown in Table 3.

Table 3. The values of t-test between the arithmetic means of the initial and the final measurement of variables for evaluating shooting ball accuracy

	Variable	Mean	Std.D.	Std.E.	Correlation	t-test	Sig.
Pair 1	SFAVTI	19.76	3.24	0.30	0.85	-22.37	0.00
	SFAVTF	23.30	2.52	0.23			
Pair 2	EFAVTI	32.33	3.35	0.31	0.90	-66.75	0.00
	EFAVTF	41.40	3.38	0.31			
Pair 3	EHAVTI	19.54	4.11	0.37	0.86	-38.26	0.00
	EHAVTF	27.45	4.42	0.40			

Based on the results gained, it can be noted that there are statistically significant differences in all variables for estimation of the shooting ball accuracy, and therefore can be said that there was statistically significant positive partial effects of the training program in the preparation period, and the t-test values were significant at the reliability level $p < 0.01$ for all variables for estimation of the shooting ball accuracy.

Discussion

The aim of this study was to, based on the training work program of forty-two (42) days, determine the level of transformation of the shooting ball accuracy with U16 soccer players, under the influence of a scheduled soccer training that included one preparatory period. This study included a sample of 120 young cadet soccer players of 4 teams, all from Niksic, competing in a unique Montenegrin cadet league and in the middle region league of Montenegro. On the basis of the obtained parameters it can be concluded that the statistically significant partial quantitative effects (changes) in all the variables

for estimation of the shooting ball accuracy obtained as a result of the training program applied in the preparation period. The method of work that has been applied in this training program abounds with exercises dominated by movements with ball in various directions, players are often found in unexpected situations, so that the positive transformations are not unexpected (Gardasevic, Bjelica, & Vasiljevic, 2016).

Based on the results of t-test for large dependent samples, with the variables for estimation of the shooting ball accuracy the statistically significant differences were determined in all pairs of variables between the initial and final states, at the level of statistical significance (significance), $p < 0.01$. It can be concluded that the training program of work in preparation period has led to the positive transformation in all variables that were estimating, by the structure of a hypothetical setting of the models, the shooting ball accuracy. In this research, the authors were guided by the fact that such a training program of work in preparation period is a very efficient way of working in terms of raising the level of the shooting ball accuracy with

cadet soccer players. The authors conclude that the summer period of 42 days, at cadet soccer players, with such training work program, is optimal for lifting the shooting ball accuracy to the level required for the competition. The gained results can be directed towards innovation of plans and programs of work in the preparation period, and adjusting the same to the needs of the talented players, because European top-level soccer clubs are continually looking for the most talented players.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Level of State Anxiety among Youth Football Players According Different Playing Positions

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Abstract

The aim of the study was to examine and describe the level of state anxiety among football players according different playing positions. The research group consisted 61 male youth football players (goalkeepers, defenders, midfielders and (forwards) attackers) of age ranged from 16 to 19, from Fanzeres Academy -city of Porto Portugal-The subjects were randomly selected and were categorized by their playing positions. The Competitive State Anxiety Inventory-2 (CSAI-2) was used to collect data, sport-specific state anxiety scale, the CSAI-2 was developed to Portuguese version. Descriptive statistics, kruskal-wallis Test and spearman's correlation analysis were used to calculate data. The results showed that there was above moderate level of state anxiety among youth football players and no significant difference in state anxiety among youth football players according playing positions. It is essential that coaches and sport psychologists develop strategies to identify the state anxiety of youth football players in order to enhance their performance.

Key words: state anxiety, football players, playing position

Introduction

Athletes and coaches often use the words “anxiety”, “stress” and “arousal” interchangeably and because their listeners generally know what they are trying to say it does not lead to miscommunication. Precision is needed. Anxiety refers to the levels of perceived threat i.e., accompanied by worry nervousness and apprehension. A key idea in anxiety is athletes' interpretation of the danger to their wellbeing. Sometimes anxiety is a normal response to real threats, such as when individuals are confronted by an armed person. Sometimes anxiety involves an exaggerated response to in imagined threat, such as my reaction to spiders (except in Australia where they can kill you!). Anxiety is typically accompanied by high arousal, but the two are not the same. People can be highly aroused yet not anxious such as when athletes win major competitions (Tod, 2014).

Spielberger (1966, 1972) further noted that for a theory of anxiety to be an adequate .it must differentiate as a mood state and as personality trait. additionally, it must differentiate

among the stimulus conditions antecedent to these forms of anxiety. Spielberger (1966) proposed the state-trait theory of anxiety, which differentiates between state and trait anxiety. State anxiety (A-state) is defined as an emotional state “characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system”. This condition varies from moment to moment and fluctuates proportional to the perceived threat in the immediate situation. Trait anxiety (A-trait), on the other hand, is “a motive or acquired behavioural disposition that predisposes an individual to perceive a wide range of objectively non-dangerous circumstances threatening and to respond to these with state anxiety reactions disproportionate in intensity to the magnitude of the objective danger”. The state-trait theory of anxiety predicts that high-trait-anxious individuals will perceive more situations as threatening and react with greater state anxiety in a greater variety of situations than low-trait-anxious individuals. Adopting a multidimensional approach, Martens, Vealey



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and Burton (1990) proposed that cognitive anxiety, somatic anxiety and self-confidence each had different relationships with performance. Performance was predicted to have a negative relationship with cognitive anxiety (increase in cognitive anxiety is associated with decrease in performance). Somatic anxiety was hypothesized to have an Inverted-U (Inverted-U theory 1908) relationship with performance. self-confidence was predicted to have a positive relationship with performance (increased self-confidence is associated with improved performance). Along with proposing the multidimensional anxiety theory, Martens also published the Competitive State Anxiety Inventory-2 (CSAI2) to help researchers test the model's predictions. In sport, anxiety plays an important role on deteriorate athlete's performance (Cox, Qiu, & Liu, 1993; Raglin & Hanin, 2000; Ortiz, 2006). Athletes realized the influence of anxiety in determining win or lose (Sanderson, 1989).

Football is a team sport. In order to succeed, it is necessary for highly specialized players in specific positions and tasks to help one another. For a successful soccer team; each player should be trained not only for conditional attributes like endurance, strength, speed or agility but also should be trained technically and tactically. In accordance with that, each player should have different physical, physiological and psychological attributes depending on his/her playing position (Akin, Kireker, & Koklu, 2009; Pivovarnicek, Pupis, & Lacena, 2015). Although there are some studies showing that psychological factors like concentration, competition anxiety, anger style, anger management, self-image, self-esteem can affect player's playing style and injury risk, they do not seem to be enough in number (Kurt, Catikkas, Omurlu, & Atalay, 2012; Martinez-Rodriguez, Chicoy-Garcia, Leyva-Vela, Martinez-Hernandez, & Manzanares Serrano, 2017).

A study conducted by Allie, Larson, and DeBeliso (2018) on levels of anxiety among North American football players. The purpose of the study was to determine if anxiety level differs between NCAA Division 1 North American football players based on position played and determine intra-individual and inter-position differences in anxiety level prior to a scrimmage versus a practice scenario. The results showed that 63.9% of players have average anxiety and no statistical differences in anxiety categories were found between positions or between the practice and the scrimmage. Another study conducted by Suleiman and Rao (2016) on competitive anxiety level of Ethiopian male football players and its impact on their performance. The descriptive Statistical analysis indicates that they were at the "average level" of competitive anxiety. The ANOVA result shows that there was no significant difference in competitive anxiety among the group of players across their playing position. A study conducted by Vincent and Yahaya (2013) on cognitive and somatic anxiety among football players of different ethnics' groups in Malaysia. The result showed that Malay ethnic categories exhibited as higher levels of cognitive anxiety, whereas Indian ethnic exhibit a higher level of somatic anxiety.

The aim of this study was to know the level of state anxiety among football players as well as to investigate the cognitive anxiety, somatic anxiety and self-confidence among football players in different playing positions. Perhaps most importantly, the study operationalized and included some new variables (youth football players ranging from 16 years to 19 years and playing different positions – goalkeepers, defenders, midfielders and forwards). The research study questions were as

follows:

QUE.1 Is there high level of state anxiety among youth football players?

QUE.2 Is there significant difference in state anxiety among youth football players according playing position?

Methods

Participant

The study consisted 61 football players from Fanzeres Academy - city of Porto Portugal. The ages of players ranged between 16 and 19 years with a mean age of 16.77 ± 1.05 years. On average, the players had played for 7.97 ± 2.43 years. A large number $N=21$ (34.4%) of the players were defenders, followed by midfielders $N=18$ (29.5%), forwards $N=16$ (26.2%), and goal keepers $N=6$ (9.8%).

Procedure

The clearance was obtained from the president of team prior to all study procedures. The test took place in a Hall Meetings on sport complex. participants provided informed consent. Then, they were provided with a questionnaire package and asked to respond to each question as honestly as possible. Coach with me remained nearby to answer any questions that arose during testing (in Portuguese language). The questionnaire package took approximately 15-20 minutes and was administered to the participants approximately 1 hour before competition.

Data analyses

Descriptive statistics was computed to characteristics the entire sample of football players, and to know level of state anxiety and Kruskal Wallis Test was used to explore the differences of Football players' state anxiety according to their playing position.

Instrument

The Competitive State Anxiety Inventory-2 (CSAI-2) was used to collect data, sport-specific state anxiety scale developed by Martens et al. (1990). The scale divides anxiety into three components: cognitive anxiety, somatic anxiety, and a related component-self-confidence. To score the CSAI-2, take all the scores for each item at face value with the exception of item 14, where you "reverse" the score. For e.g., if you circled 3, count that as 2 points (1=4; 2=3; 3=2; 4=1). Total scores in the following manner: Cognitive state anxiety: Sum items 1, 4, 7, 10, 13, 16, 19, 22, and 25. Somatic state anxiety: Sum items 2, 5, 8, 11, 14, 17, 20, 23, and 26. Self-confidence: Sum items 3, 6, 9, 12, 15, 18, 21, 24, and 27. The scores for each will range from 9 to 36, with 9 indicating low anxiety (confidence) and 36 indicating high anxiety confidence.

The CSAI-2 was developed by Cruz et al. (2006) to Portuguese version. It was formed also same dimensions but with a reduction to 22 items s (Cognitive state anxiety: sum: 1, 4, 6, 9, 12, 15, 18, and 21. Somatic state anxiety: Sum items, 2, 7, 10, 13, 16, and 19. Self-confidence: Sum items, 3, 5, 8, 11, 14, 17, 20, and 22.). In present study reliability and validity of Competitive State Anxiety Inventory-2 (CSAI-2) were done.

Results

Level of state anxiety

Findings related to the level of state anxiety among football players are shown in Table 1.

Table 1. Shows level of state anxiety among football player (N=61)

Items of scale	Mean	Std. Dev.
1. I'm worried about this game	2.95	0.948
2. I feel restless	2.29	0.837
3. I feel comfortable	3.24	0.783
4. I'm worried because I may not play good in this game	2.68	1.068
5. I feel self-confident	3.08	0.816
6. I'm worried because I might have lost the game	2.93	0.946
7. I feel tension in my stomach	1.92	0.881
8. I feel safe	3.16	0.840
9. I'm worried that I might fail under the pressure of competition	2.68	0.988
10. I feel my body relaxed	3.08	0.829
11. I am confident that I can respond to the challenge that is set to me	3.23	0.789
12. I am worried that you may have poor performance	2.64	1.,141
13. My heart is beating very fast	2.15	1.053
14. I am confident that I will have a good performance	3.23	0.673
15. I am concerned that I may not achieve my objective	2.66	1.044
16. I feel my stomach "around"	1.89	0.950
17. I feel mentally relaxed	3.08	0.869
18. I am concerned that others may be disappointed with my performance	2.36	1.033
19. My hands are cold and wet	1.62	0.934
20. I am confident because I mentally imagine myself to achieve my goal	3.16	0.772
21. I am worried that I may not be able to concentrate	2.33	1.044
22. I am confident that I can overcome obstacles under the pressure of competition	3.20	0.840
Total	2.71	0.913

In Table 1, the average scores of state anxiety among football players for each item are given. It may be observed that football players had above average scores in total (M=2.71), remarkably, they scored lower on the nineteenth (M=1.62) and higher on the eleventh and the fourteenth (M=3.40).

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State anxiety among football players according playing positions

Football players' state anxiety was also examined according to their playing position as indicated in Table 2.

Table 2. Shows comparison of Football players' state anxieties according to their playing position

Scale	Dimension	Position	N	Mean	Std. Dev.	Sig.
State anxiety	Cognitive state anxiety	Goalkeeper	6	2.77	0.768	0.751
		Defender	20	2.56	0.801	
		Midfielder	19	2.76	0.604	
		Forward	16	2.63	0.794	
		Total	61	2.68	0.741	
	Somatic state anxiety	Goalkeeper	6	1.86	0.340	0.751
		Defender	20	2.19	0.704	
		Midfielder	19	2.20	0.540	
		Forward	16	2.14	0.510	
		Total	61	2.09	0.523	
	Self-confidence	Goalkeeper	6	2.76	1.123	0.571
		Defender	20	3.18	0.595	
		Midfielder	19	3.12	0.387	
		Forward	16	3.40	0.414	
		Total	61	3.11	0.909	

In Table 2, the average scores of state anxiety dimensions among football players are given. It may be observed that football players had higher average scores (M=3.11) in self-confidence dimension, remarkably, they scored lower average scores (M=2.09) in somatic state anxiety dimension and they had average scores (2.68) cognitive state anxiety dimension.

Kruskal-Wallis Test was used also to compare football players' state anxiety according to playing position. The comparison analysis demonstrates that there were no significant differences ($p>0.5$) between cognitive state anxiety, somatic state anxiety and self-confidence.

Discussion

The study, which was carried out to determine the level of state anxiety among football players, revealed some important information and results. As results of this study, it was concluded that the football players had above moderate level of state anxiety although the youth players belong to amateur team. The mental component, typically termed cognitive anxiety, is closely related to worry and deals with 'negative expectation and cognitive concerns about oneself, the situation at hand and potential consequences' (Morris, Davis, & Hutchings, 1981). Athletes can develop cognitive anxiety because of their inability to perform or fear of performance failure. Athletes also have the tendency to worry the negative evaluation of their schoolmate, teachers, friends, fans, which can cause the level of cognitive anxiety increase. As well as somatic anxiety refers to athletes' changes in their physiology, such as increased perspiration, difficulty in breathing, increased heartbeat, changes in the brain wave, elevated blood pressure, increased urination, butterflies in the stomach, less saliva in the mouth and muscle tension. The sympathetic nervous system is stimulated by fear perception in the cerebral cortex, prompting an immediate stress response. Athletes, who have learned anxiety management skills, often respond to a greater degree to anxiety symptom but return to their resting rate sooner than those athletes, who are not trained in anxiety management (Vincent & Yahaya, 2013). This result corresponds to the findings of (Turksoy, Bayansalduz, Altinici, & Atikir, 2012; Zeng, 2003; Allie et al., 2018).

The results were concluded that no significant difference was found when comparing football players' state anxiety according the playing positions. This finding is inconsistent with the results of other investigations (Kirkcaldy, 1982; Andrew, Grobbelaar, & Potgieter, 2007; Eloff, Monyeki, & Grobbelaar, 2011). Kirkcaldy (1982) for example, found that players in defensive positions in soccer showed higher emotional stability than players in attacking positions. Another probable reason for inconsistency between the current findings and those stemming from earlier research was the young age of the participants. McCarthy, Jones, Harwood and Olivier (2010) postulated that young sport participants have less approximations of psychological skill usage compared to adult participants. The mean age of the sample in the present study was 16.77 ± 1.05 years old, which could be attest to insignificant relationship noticed between psychological skills and playing positions. Jooste, Steyn and Van den Berg (2014) support this view by conceding that athletes in the specialization stage (mean age 16.2 ± 1.13 years) may be at the ideal "windows of opportunity" for developing adult-like attributes and should, therefore, not be compared to older athlete's groups. In fact, the current study failed to concur with other investigations could be explained by the amateur level of participation of the sample tested in the present study. The results of the present study suggest that youth football players competing at amateur level they had homogeneously some psychological characteristics regardless of their respective position in the team. This finding, pertinent to soccer players, is corroborated by Kurt et al. (2012) who credited such homogenous results to the similar status (amateur/professional) of the participants. As well as the results of study is consistent with results of (Allie et al., 2018; Suleiman & Rao, 2016).

In conclusion, when making literature reviews, as parallel

with many researches, present study was inconsistent with studies and consistent with others. The findings indicated there was above moderate level of state anxiety among youth football players. And the different playing positions were compared in term of state anxiety, there was no significant difference in state anxiety among football players according playing positions. Can be said that this situation is largely related to the groups having similar status (amateur), similar age and football experience. Future qualitative research which covers the test having multi-variables on state anxiety and others psychological characteristics could be performed. And suggesting a program to decrease state anxiety among football players.

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Conflict of Interest

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ORIGINAL SCIENTIFIC PAPER

Attitudes of Consumers from Autonomous Province of Vojvodina toward Advertising through Sport for the Question: How Often Do Consumers Purchase Sporting Goods

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Abstract

This research was aimed at gaining relevant knowledge about the attitudes of the consumers from the Autonomous Province of Vojvodina toward advertising through sport for the question how often do consumers purchase sporting goods. The sample included 451 students from Faculty of Sport and Physical Education, Faculty of sport and tourism in Novi Sad and Chemical, Biotechnology and Medicine Department in Subotica, divided into six subsamples: consumers who do not purchase sporting goods at all, then consumers who purchase sporting goods less than once a month, next 1–3 times a month, 4–6 times a month, 7–9 times a month, as well as consumers who purchase sporting goods more than 10 times a month. The sample of variables contained the system of three general attitudes which were modelled by the seven-point Likert scale. The results of the measuring were analysed by multivariate analysis (MANOVA), univariate analysis (ANOVA) and Post Hoc test. Based on the statistical analyses it was found that significant differences occur at multivariate level, as well as among all three variables at a significance level of ($p=.000$). Hence, it is interesting to highlight that it was found that significant differences showed up between the consumers who purchase sporting goods. The significant differences were found in two out of three variables, while the consumers who purchase sporting goods less than 3 times a month had much more negative attitudes toward advertising through sport.

Key words: attitudes, advertising, sporting goods, Vojvodina

Introduction

Guided by the fact that investment in advertising through sport as part of the corporate marketing strategy is continually growing, the demand for research in this area has been generated in order to determine the best prospects of it (Muratovic, Bjelica, & Popovic, 2014). A systematic study of consumers' attitudes toward advertising was rooted in the Bauer and Greyser's studies (Popovic, 2011), while the one who made major contribution to science when it comes to advertising through sport was Pyun (Klacar & Popovic, 2010), who has conducted a research in which he constructed a new model for consumer behaviour-related research into sports advertising,

which enabled various researchers to examine consumers' attitudes and beliefs about advertising through sport around the world, and compare their conclusions. In studies investigating attitudes towards general advertising in the 1940s and 1950s, according to Bauer and Greyser (Popovic, Bjelica, Jaksic, & Georgiev, 2013, Popovic, 2015, Popovic & Milasinovic, 2016) it has been concluded that consumers generally have positive attitudes. However, by comparing the results with recent research (Bjelica & Popovic, 2011, Popovic, 2011b; Popovic, Matic, Milasinovic, Jaksic, & Bjelica, 2015a; Popovic, Matic, Milasinovic, Jaksic, & Bjelica 2015b; Popovic, Jaksic, Matic, Bjelica, & Maksimovic, 2015), it has been found that consumers have



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a more and more negative attitude toward advertising. After a while, Shavitt and his associates (Bjelica & Popovic, 2011) have found that respondents in their study have much more positive attitudes towards advertising than it was the case in previous studies. It is assumed that attitudes vary among respondents, as they differentiate certain types of advertising messages, and Mittal (Popovic, 2011) has found that they have much more negative attitudes towards advertising on television than towards advertising in general. With the increase in negative attitudes toward advertising on television, marketers have had to devise a way to bring back the audience's confidence in television advertisement, and they did this by applying technological innovations such as video recorders which allowed the viewers who are indifferent toward advertising messages, to skip parts that were not interesting to them (Bjelica, Popovic, Jaksic, Hadzic, & Akpınar, 2014; Bjelica & Popovic, 2015a; Bjelica & Popovic, 2015b; Bjelica, Gardasevic, Vasiljevic, & Popovic, 2016a; Bjelica, Gardasevic, Vasiljevic, & Popovic, 2016b). Along with the above-mentioned invention, attitudes towards advertising through sport have, again, become much more positive. However, this invention did not allow viewers to skip parts of the program with advertising messages when it comes to watching sports events, as they occurred at the time of the events. Nevertheless, the closeness and affection towards sport and sportsmen over time have aided overcoming the negative attitudes of viewers that they have had when advertising in general in question, which led advertising through sport to take up the place that belongs to it today. The question that arises is how the purchase of sporting goods affects consumers' attitudes toward advertising through sport which is one of the many problems that not many authors have encountered so far (Bajramovic, Zoric, & Masanovic 2018; Gardasevic, Bajramovic, & Masanovic, 2018; Milovic, Corluka, & Masanovic, 2018; Masanovic, 2018; Molnar, Masanovic, & Bjelica, 2018; Stupar, Gardasevic, & Masanovic, 2018), and it is the exact goal of this study.

Methods

The population of this study consisted of the students of the Faculty of Sport and Physical Education, the Faculty of Sport and Tourism in Novi Sad and the High Schools of Vocational Studies for Education of Teachers and Trainers in Subotica who were residents of the Republic of Serbia at the time of the survey, while the sample was organized by combining or decomposing, so that the different properties of said population and the various spaces in which it existed were treated.

The questionnaires were distributed to undergraduate students in printed and electronic form. A total of 470 questionnaires were collected, but 19 questionnaires were excluded from the analysis, since they were not adequately completed, so that 451 respondents (randomly selected students of the Faculty of Sport and Physical Education, Faculty of Sport and

Tourism in Novi Sad and High Schools for Vocational Education for Trainers and Coaches in Subotica) took part in this research. The research instrument was a standardized questionnaire (Popovic, 2011) which consisted of two parts, general attitudes towards sports commercials, and socio-demographic characteristics of respondents when it comes to the frequency of buying sporting goods during one month. The system of variables in this questionnaire consisted of three statements that the respondents needed to evaluate according to the seven-degree Likert scale and the six socio-demographic characteristics of the respondents (not buying at all, less than once a month, 1-3 times per month, 4-6 times per month, 7-9 times per month, and more than 10 times per month). Completing the questionnaire did not take too long, about 10 minutes on average and respondents participated voluntarily in the survey. It is important to point out that the survey was anonymous and that all responses were classified as strictly confident. It is also worth noting that the respondents, in addition to all the above mentioned, had the opportunity to cancel their participation in the survey at any moment, but none of them decided to do so.

Empirical data were analysed using the statistical package for social sciences (SPSS 20.0), and as a first step, descriptive statistics was used for calculating the frequency in the first place, then the arithmetic mean, Standard deviation, as well as the Skewness and Flattening measures (Kurtosis) for each statement. Since the variables in this study were on nonparametric scales, for the detailed analysis that followed, it was necessary to transform them into higher order scales using Blom's method. Then, using the multivariate variance analysis (MANOVA), the univariate variance analysis (ANOVA) and the LSD Post Hoc test, the differences in the general attitudes of the respondents toward advertising through sport in relation to the frequency of buying sporting goods during one month have been found.

Results

The first table shows descriptive statistics for all three claims that are in relation with the general attitudes of the respondents toward advertising through sport. First of all, the arithmetic mean which reflects the positive values of attitudes when all three claims are concerned is depicted, while the values of standard deviation show that the elements together do not deviate significantly from the arithmetic mean. When it comes to the measures of asymmetry (Skewness) and flattening (Kurtosis), the negative values of asymmetry in all variables show that most of the results are right from the mean, among the higher values, while the negative values of flattening, for all three are variable (GSS1, GSS2 and GSS3), show that the distribution is flatter than normal, i.e., that there are more results accumulated on the distribution tails.

Table 1. General attitudes towards advertising through sport

	Mean	S. D.	Skewness		Kurtosis	
			Statistic	S. E.	Statistic	S. E.
GSS1	4.80	1.637	-.409	.115	-.370	.229
GSS2	5.18	1.569	-.615	.115	-.266	.229
GSS3	4.53	1.495	-.244	.115	-.245	.229

Legend: Mean–Arithmetic mean; S.D.–Standard deviation; Skewness–Measures of asymmetry; Kurtosis–Measures of flattening; Statistic–Statistic value; S.E.–Standard error; GSS1–“My general opinion is in favour of advertising through sport”; GSS2–“Generally, I consider advertising through sport a good thing”; GSS3–“Generally, do you like or dislike advertising through sport?”

In the continuation of this study, comparative statistics of general attitudes towards advertising through sport are shown. They were obtained by using the multivariate variance analysis (MANOVA), the univariate analysis of variance (ANOVA) and the LSD Post Hoc test, in order to determine the difference in the general attitudes of the respondents toward advertising through sport in relation to the frequency of buying sporting goods.

By inspecting the second table which shows the results of the multivariate analysis, it is clearly evident that there is a statistically significant difference in the whole system of the compared parameters in the general attitudes toward advertising through sport in relation to the frequency of buying sporting goods ($p=.005$).

Table 2. Multivariate significance of differences in the system of general attitudes towards advertising through sport among respondents with different habits when buying sporting goods in question

		N	Mean	S. D.
GSS1	Do not buy	65	4.34	1.564
	< 1	148	4.67	1.708
	1 – 3	174	4.95	1.660
	4 – 6	31	5.39	1.202
	7 – 9	14	5.21	1.251
	> 10	19	4.79	1.619
	Total	451	4.80	1.637
GSS2	Do not buy	65	4.60	1.628
	< 1	148	5.09	1.659
	1 – 3	174	5.33	1.487
	4 – 6	31	5.68	1.107
	7 – 9	14	5.57	1.342
	> 10	19	5.37	1.739
	Total	451	5.18	1.569
GSS3	Do not buy	65	3.74	1.632
	< 1	148	4.43	1.508
	1 – 3	174	4.75	1.386
	4 – 6	31	4.97	1.080
	7 – 9	14	4.93	1.141
	> 10	19	4.95	1.747
	Total	451	4.53	1.495

$F=2.210$; $p=.005$

By inspecting the third table which shows the results of the univariate analysis, it is clearly noted that there were also statistically significant differences in general attitudes toward ad-

vertising through sport in relation to the frequency of buying sporting goods for all three variables.

Table 3. Univariate significance of difference in the system of general attitudes towards advertising through sport among respondents with different habits when buying sporting goods in question

	F	p
GSS1	2.528	.029
GSS2	3.093	.009
GSS3	5.888	.000

Inspecting the next three tables which show the results of the Post Hoc test, will indicate the significance of the differences between the pairs of individual entities with different habits when buying sporting goods in question for each variable.

According to the results that have appeared on the univariate level, statistically significant differences in the individual parameters with all three variables are expectedly noticed.

Table 4. Identification of significant differences in the system of general attitudes toward advertising through sport by utilizing the Post Hoc test between individual entities with different habits when buying sporting goods in question, for the statement "My general opinion is in favour of advertising through

vs	Do not buy	< 1	1 - 3	4 - 6	7 - 9
< 1	.172				
1 - 3	.010	.125			
4 - 6	.003	.026	.166		
7 - 9	.068	.230	.556	.741	
> 10	.287	.761	.686	.207	.458

The results of the Post Hoc Test in the fourth table point to the fact that in the first statement “My general opinion is in favour of advertising through sports”, there are differences primarily among those who do not buy sporting goods, and those that buy sporting goods 1-3 times and 4-6 times per month. Differences also occur among respondents who

buy sporting products less than once a month and a group of respondents who do it 4-6 times a month. The most positive outcomes can be observed in groups buying sporting products 4-6 times a month, while the least positive results are noticed in two groups that least buy sports products.

Table 5. Determining significant differences in the system of general attitudes towards advertising through sport by applying Post Hoc test between individual entities with different habits when buying sporting products in question, for the statement “Generally, I consider advertising through sport a good thing”

vs	Do not buy	< 1	1 - 3	4 - 6	7 - 9
< 1	.033				
1 - 3	.001	.180			
4 - 6	.002	.058	.248		
7 - 9	.034	.272	.572	.832	
> 10	.058	.469	.913	.495	.710

The results of the Post Hoc Test in the fifth table point out that, in other words, “Generally, I consider advertising through sport a good thing”, the differences appear first of all among those who do not buy sports products and most

of the other entities. The most positive outcomes can be observed in groups buying sports products 4-6 times a month, while the least positive results are noticed in the group that purchases sports products the least.

Table 6. Determining significant differences in the system of general attitudes toward advertising through sport by applying Post Hoc test between individual entities with different habits when buying sporting products in question, for the statement: “Generally, do you like or dislike advertising through sport?”

vs	Do not buy	< 1	1 - 3	4 - 6	7 - 9
< 1	.002				
1 - 3	.000	.045			
4 - 6	.000	.060	.450		
7 - 9	.006	.218	.664	.933	
> 10	.002	.142	.581	.962	.971

The results of the Post Hoc Test in the sixth table indicate that in the third claim “Generally, do you like or dislike advertising through sport”, there are differences primarily among respondents who don’t buy sporting goods and all other groups. Differences also appear among those who do not buy sporting goods and entities that do it 1-3 times a month. The most positive outcomes can be observed in groups buying sporting products 4-6 times a month, while the least positive results are noticed in two groups that buy sporting products the least.

Discussion

Since the results showed that respondents have a very positive attitude towards advertising through sport, which is confirmed with the high value of the arithmetic mean for all three variables, and that almost two thirds of respondents have a positive attitude towards advertising through sport, which is reflected in extremely negative values of asymmetric measures, it should be emphasized that these results are consistent with the results of the previous research (Molnar, Lilic, Popovic, Akpinar, & Jaksic, 2011; Popovic, Jaksic, Matic, Bjelica, & Maksimovic, 2014; Popovic, Bjelica, Georgiev, & Akpinar, 2011), and that there are no significant differences that are worth mentioning. The obtained results also show that respondents living in different locations, such as the United States, Turkey, Montenegro, Serbia and Bosnia and Herzegovina, have positive attitudes toward advertising through sport while, however, for the sake of comparison, it is worth mentioning that, according to Mittal (Bjelica et al.,

2016a; Bjelica et al., 2016c), various studies point to negative attitudes when advertising products in traditional industries is concerned. Therefore, it is more than evident that the use of sports in modern business communication has influenced a significant change in the general attitude of consumers when advertising is concerned, and the recognition of the attractiveness of sports has allowed business organizations to approach sporting consumers and affect their behaviour in a much more subtle way.

By determining the difference in the general attitudes of respondents toward advertising through sports compared to the frequency of purchasing sports goods, this study found differences in attitudes among respondents who have reported different habits of shopping sporting goods. These differences appeared in all three variable at the univariate level. In all three reportable “My general opinion is in favor of advertising through sport”, “Generally, I think that advertising through sport is a good thing”, and “Generally, do you like or dislike advertising through sport?”, the most positive results are noticed in the group that buys sports products 4-6 times a month, while the least positive results are noticed in those groups that do not buy sports products. Based on the statistical analyses, significant differences were found at the multivariate level, as well as among all three variables at the univariate level of significance of $p=.05$. It is also interesting to point out that the vast majority of respondents identified with one out of two entities, 322 (out of 451), primarily with consumers who buy sports products less than once a month and with consumers who buy sports products once or three times a month.

Future research should focus on a larger number of respondents, as a significant number of respondents group into a category with fewer purchases of sports products during the month, especially because some differences are expected to be interesting and useful for both theory and practice.

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ORIGINAL SCIENTIFIC PAPER

Differences in Anthropometric Characteristics among Junior Soccer and Handball Players

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Abstract

The aim of this study was to obtain the relevant knowledge about significant differences in some anthropometric characteristics of junior soccer and handball players. The sample included 40 male subjects divided into two subsamples. The first subsample included 25 subjects, who train in the junior selection in the Football club Vojvodina from Novi Sad, while the other subsample included 15 subjects who train in the junior selection in the Handball club Vrbas, from Vrbas. The variables sample included 20 anthropometric measures that defined longitudinal and transversal dimensionality of skeleton, volume and mass of the body, and subcutaneous adipose tissue. The results is analysed in a statistical procedure marked as a significance testing of two arithmetic means of the independent samples, a t-test at the level of significance of $p < 0.05$. Based on the result, it was concluded that significant differences occur in wrist diameter, ankle joint diameter, upper arm circumference (min), upper arm circumference (max), lower leg circumference (max), upper arm skinfold, lower arm skinfold, thigh skinfold, calf skinfold, chest skinfold and abdomen skinfold, while the significant difference does not occur in body height, bodyweight, elbow diameter, knee diameter, lower arm circumference (min), lower arm circumference (max), upper leg circumference (min), upper leg circumference (max), and lower leg circumference (min).

Key words: anthropometric measurement, different sports, junior league

Introduction

Athletes, competing in different sports and sports disciplines, differ in their physical and physiological characteristics (Stojanovic et al., 2016; Morteza Tayebi, Mahmoudi, Shirazi, & Sangi, 2017). All competitive sports practiced at a higher level require that the body performs at the optimal biomechanical and physiological capacity (Saavedra et al., 2018). Logically, a junior athlete competing in the strongest leagues in his age group is expected to have the optimal physique, strength, and endurance for the functional requirements of the sport in question (Masanovic, 2018a). Morphological characteristics are of great importance when it comes to orientation and selection in all sports disciplines since they are present in the equation of the specification of almost every sport (Nikolaidis & Vassiliou-Karydis, 2011; Gjonbalaj, Georgiev, & Bjelica, 2018). The coefficients of participation of some morphological dimensions in the equation of the specification a particular sport

are constantly changing, primarily due to the development of technique and tactics, therefore for effective identification of talents, the continuous participation of sports science and practice is required (Popovic, Bjelica, Jaksic, & Hadzic, 2014).

Body mass can affect the speed, durability and physical dominance of athletes, while the composition of the body inevitably affects the strength and agility, and for the successful handling of football and handball, each individual requires a high level of athletic abilities and appropriate atropometric characteristics and body composition, beside high level of technical and tactical skills (Popovic, Akpinar, Jaksic, Matic, & Bjelica, 2013).

Soccer is a team sport which is played on an open field of great dimensions, and therefore requires a high standard of physical preparation, it is also based on a large number of movements, and a series of moderate activities that periodically replace high intensity activities, leading to significant



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metabolic heat production, and an intensity of 75-90% of the maximum heart rate, or 70-80% of the maximum oxygen consumption (Rexhepi & Brestovci, 2010; Sæther, 2017; Amani, Sadeghi, & Afsharnezhad, 2018). On the other hand, handball is played in the field of smaller dimensions, however, it is considered as one of the fastest team sports and also requires great durability and strength due to constant contact with the opponent's body and specific maneuvers such as jumping, pressurizing, blocking and shooting on goal (Bilge, 2013; Masanovic, Milosevic, & Corluka, 2018).

The aim of this research is to describe the morphological profile of young soccer and handball players, to determine if there is a difference in anthropometric dimensions between them, and to define its scale.

Methods

The sample included 40 male subjects divided into two subsamples. The first subsample included 25 soccer players (16.64 ± 0.49 yrs), who trained in the junior selection in the Soccer club "Vojvodina" from Novi Sad, which competed in Serbian Junior League, while the other subsample included 15 handball players (16.93 ± 0.59 yrs), who trained in the junior selection in the Handball club "Vrbas" from Vrbas, which also competed also in Serbian Junior League. Criteria for selection of subjects for the sample were as follows: they have been members of the first team squad for at least one year and that they are in good health.

Anthropometric research technique is used for data collection. A total of 20 anthropometric measures were evaluated, that defined the longitudinal and transversal dimensionality of skeleton, body volume and body mass, and subcutaneous adipose tissue: body height, body weight, elbow diameter, wrist diameter, knee diameter, ankle joint diameter, minimum circumference of the upper arm, maximum circumference of the upper arm, minimum circumference of the forearm, maximum circumference of the forearm, minimum circumference

of the upper leg, maximum circumference of the upper leg, minimum circumference of the lower leg, maximum circumference of the lower leg, skinfold thickness of the upper arm, skinfold thickness of the forearm, skinfold thickness of the thigh, skinfold thickness of the calf, skinfold thickness of the chest and skinfold thickness of the abdomen.

Anthropometric research was conducted according to IBP standards, while respecting the basic rules and principles related to the selection of parameters, standard conditions and measuring techniques, as well as the standard measuring instruments calibrated before measuring.

The measuring was carried out in the middle of the competitive season. The data obtained in the research were analyzed with the statistical program SPSS 20.0, adapted for use on personal computers. The arithmetic mean, standard deviation and standard errors of the arithmetic mean of the anthropometric characteristics were calculated for respondents who are professional soccer players and professional handball players, by testing the differences of arithmetic means of independent samples at a significance level of $p < 0.05$. This analysis gave answer to the question whether there is a difference, and the scope of it, between the anthropometric characteristics of the soccer and handball players, regulars who compete in union divisions.

Results

This section presents the results of central tendency and dispersion parameters, as well as the results of t-test for independent samples, classified into tables. Observing the results of the central tendency and dispersion parameters of longitudinal and transversal skeletal dimensionality, body volume and body mass of the soccer and handball players, we immediately notice that handball players have higher value in 18 variables, while soccer players have higher values in only 2 parameters (Table 1).

Table 1. Descriptive Statistics of Anthropometric Measures

	Soccer N=25	Handball N=15
	AM \pm SD	AM \pm SD
Body height (cm)	177.80 \pm 6.63	181.51 \pm 5.33
Bodyweight (kg)	69.90 \pm 6.78	74.73 \pm 10.17
Elbow diameter (mm)	70.60 \pm 3.17	69.95 \pm 4.32
Wrist diameter (mm)	55.67 \pm 2.87	59.96 \pm 6.21
Knee diameter (mm)	99.74 \pm 4.02	101.17 \pm 7.36
Ankle joint diameter (mm)	72.20 \pm 2.25	76.48 \pm 6.21
Upper arm circumference (min) (cm)	27.62 \pm 1.90	29.17 \pm 2.81
Upper arm circumference (max) (cm)	29.54 \pm 2.12	31.47 \pm 2.92
Lower arm circumference (min) (cm)	16.96 \pm 0.84	17.10 \pm 1.17
Lower arm circumference (max) (cm)	24.84 \pm 1.18	25.83 \pm 2.03
Upper leg circumference (min) (cm)	39.80 \pm 2.38	40.27 \pm 3.54
Upper leg circumference (max) (cm)	54.04 \pm 3.63	56.53 \pm 5.63
Lower leg circumference (min) (cm)	23.64 \pm 1.04	23.60 \pm 1.45
Lower leg circumference (max) (cm)	35.46 \pm 1.81	37.77 \pm 2.86
Upper arm skinfold (mm)	4.82 \pm 1.29	6.20 \pm 1.22
Lower arm skinfold (mm)	5.65 \pm 1.65	6.77 \pm 1.70
Thigh skinfold (mm)	9.40 \pm 3.23	14.40 \pm 4.27
Calf skinfold (mm)	8.10 \pm 2.32	11.60 \pm 2.87
Chest skinfold (mm)	7.18 \pm 1.92	9.60 \pm 3.46
Abdomen skinfold (mm)	6.82 \pm 1.99	9.59 \pm 4.03

Legend: N – number of Subjects, AM – arithmetic mean, S – standard deviation

On the basis of the results presented it was determined that the subsamples are significantly different in 11 out of 20 anthropometric characteristics (level of significance $p < 0.05$). Based on results, it was concluded that significant differences occur in wrist diameter, ankle joint diameter, upper arm circumference (min), upper arm circumference (max), lower leg circumference (max), upper arm skinfold, lower arm skinfold, thigh skinfold, calf skinfold, chest skinfold and abdomen skin-

fold, while the significant difference does not occur in body height, bodyweight, elbow diameter, knee diameter, lower arm circumference (min), lower arm circumference (max), upper leg circumference (min), upper leg circumference (max), and lower leg circumference (min). For each of the parameters in which a significant difference has been found, higher values can be seen in handball players (Table 2).

Table 2. Independent Samples t-test

	F	T	Df	P	MD	SED	Min	Max
Body height	.20	-1.83	38	.075	-3.71	2.02	-7.80	0.39
Bodyweight	3.19	-1.81	38	.079	-4.83	2.68	-10.25	0.59
Elbow diameter	.65	.55	38	.585	0.65	1.19	-1.75	3.06
Wrist diameter	4.80	-2.98	38	.005	-4.29	1.44	-7.20	-1.37
Knee diameter	9.24	-0.80	38	.430	-1.43	1.79	-5.06	2.20
Ankle joint diameter	3.04	-3.14	38	.003	-4.28	1.36	-7.04	-1.52
Upper arm circumference (min)	6.14	-2.08	38	.045	-1.55	0.74	-3.05	-0.04
Upper arm circumference (max)	2.53	-2.41	38	.021	-1.93	0.80	-3.54	-0.31
Lower arm circumference (min)	2.39	-.44	38	.662	-0.14	0.32	-0.78	0.50
Lower arm circumference (max)	9.94	-1.96	38	.057	-0.99	0.51	-2.02	0.03
Upper leg circumference (min)	4.48	-.50	38	.620	-0.47	0.93	-2.36	1.43
Upper leg circumference (max)	5.77	-1.71	38	.096	-2.49	1.46	-5.45	0.47
Lower leg circumference (min)	2.51	.10	38	.920	0.04	0.39	-0.76	0.84
Lower leg circumference (max)	7.03	-3.14	38	.003	-2.31	0.73	-3.79	-0.82
Upper arm skinfold	.12	-3.33	38	.002	-1.38	0.41	-2.22	-0.54
Lower arm skinfold	.82	-2.07	38	.045	-1.13	0.54	-2.23	-0.02
Thigh skinfold	2.50	-4.20	38	.000	-5.00	1.19	-7.41	-2.59
Calf skinfold	.05	-4.22	38	.000	-3.50	0.83	-5.18	-1.82
Chest skinfold	12.23	-2.86	38	.007	-2.42	0.85	-4.14	-0.71
Abdomen skinfold	9.41	-2.91	38	.006	-2.77	0.95	-4.70	-0.85

Legend: F–value of Levene’s test of equality of variances, t–value of t-test, df–number of degrees of freedom, p–significance of two-tailed testing of arithmetic mean difference, MD–arithmetic mean difference, SED–standard error of difference, Min–the level of lower difference interval, Max–level of

Discussion

On the basis of the data obtained in this study, it was found that there are significant differences in certain anthropometric characteristics between soccer players and handball players who compete in the best junior leagues in Serbia. When it comes to longitudinal dimensionality, significant differences have not been found at body height, which is not supported by previous research (Taborsky, 2007; Popovic, Bjelica, Petkovic, & Muratovic, 2012). The body height of handball players obtained by this study raises doubt that the selection process has been carried out correctly especially due to the fact that official statistical data proved that Serbian handball players are shorter than the most successful teams which participated in the IHF Men’s Youth World Championship played in Russia 2015. For example, the average body height of the players of the French National team, the winning team, was 191.8 centimeters, while the 13th Korea had an average of 183.4 centimeters and 19th Poland had an average 190.1 centimeters. This insight may suggest the coaches from Serbia to follow the recent selection process methods and to be more careful during the talent identification as they have a very tall population in general (Bjelica et al., 2012; Milasinovic, Popovic, Matic, Gardasevic, & Bjelica, 2016; Popovic, 2017; Masanovic, 2018b). The absence of a significant body mass difference is also a surprise, as the previous literature indicates a significantly higher body weight of the handball

players (Sedeaud et al., 2014), which again points to gaps in the selection of the examined group of players.

Results related to measures of the skeleton transversal and body volume showed significantly higher values for handball players. Subcutaneous adipose tissue showed significantly higher values for handball players for all 6 variables (upper arm skinfold, lower arm skinfold, thigh skinfold, calf skinfold, chest skinfold, abdomen skinfold). These results are in line with previous research (Muratovic, Vujovic, & Hadzic, 2014; Gusic, Popovic, Molnar, Masanovic, & Radakovic, 2017; Vukotic, Corluka, Vasiljevic, & Bubanja, 2018) which is also logical because in research, soccer is recognized as an aerobic sport in which activity lasts longer and running distance is greater (Popovic et al., 2013; Popovic, Masanovic, Molnar, & Smajic, 2009; Gardasevic, Bjelica, & Popovic, 2015). On the other hand, handball is played on a smaller pitch, the running distance during the match is less which justifies somewhat higher value of the thickness of the skin folds. Considering the movement patterns in handball, bigger diameters of hand wrist diameter and ankle joint diameter, and higher values of upper arm circumference (max) and lower arm circumference (min), are expected primarily for the reason that handball is a sport that requires a lot of power, constant contact with hands and body with an opponent, as well as specific maneuvers such as shooting, blocking and jumping, and the strength of the arm, shoulder band and ankle joint gives advantage

in defense and attack because players who have that ability can gain easier an advantage in the mentioned elements of the game (Vila Suarez, Ferragut, Alcaraz, Rodriguez Suarez, & Cruz Martinez, 2008; Masanovic et al., 2018).

Being a professional athlete requires a high level of preparation which, in addition to motor and functional abilities, must be supported by morphological characteristics that should correspond, through the perfect harmony, based on sport structure, to the rank of the competition and the specifics of the player position, which differ within almost every sport branch (Vukasevic, Spaic, Masanovic, 2018).

The aim of this research was to determine whether there is a difference, and the scope of it, in anthropometric characteristics between the junior soccer and handball players, and to characterize, as accurately as possible, the morphological characteristics of subjects by measuring the individual body parts.

Considering the movement patterns in handball, slightly greater body height and body mass, are expected primarily for the reason that handball is a sport in which body height gives advantage in defence and attack because taller players have the ability to easily shot through the opponent's defense and set a strong defensive goal in front of their goal through which opposing attackers have less chance of hitting (Muratovic et al., 2014; Gusic et al., 2017), while bigger diameters of the most joints, and higher values of al extremities' circumferences are expected because these features allow players to gain an advantage during the performance of defensive elements that contain the grit and capture, and also give an edge in the performance of the shot that is the most important element of the game (Popovic et al., 2014). Movement patterns in soccer are the reason for lower subcutaneous adipose tissue values for soccer players because in research, soccer is recognized as an aerobic sport in which activity lasts longer and running distance is greater (Popovic et al., 2013). On the other hand, handball is played on a smaller pitch, the running distance during the match is shorter, and the players on certain positions are capable (thanks to their heavier) topush out the opponent and get better position for a shot (Massuca & Fragoso, 2011), which justifies somewhat higher value of the thickness of the skin folds. However, smallest difference is the seen in the arm skinfold variables and bigger in the thigh an abdomen skinfold. The reason for that can be found in the fact that handbal players use both upper and lower extremities during the game, which is not the case in soccer.

Morphological characteristics of topclass soccer and handball players appear to be of great interest for some authors (Krespi, Sporis, & Popovic, 2019; Barraza et al., 2015) with the interest of finding the best morphology somatotype for particular sports, competition levels and player positions as well. Comparison of anthropometrics should support coaches with better understanding of specific demands of certain sport, where particular morphology profile of athlete, combined with motor and functional abilities, should express its full potential (Gusic et al. 2017).

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

The Effect of Physical Therapy in Patients with Chronic Low Back Pain

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Abstract

Low back pain is the most common cause of disability. Epidemiological studies have generally considered that risk factors for starting backache are interrelated in three dimensions: individual factors and lifestyle, physical or biomechanical factors, and psychosocial factors. The main aim of this study was to evaluate the efficacy of physical therapy in patients with chronic non-specific low back pain. This retrospective study was conducted at the Diagnostic Therapeutic Center Rezonanca, Department of Physiotherapy in Prishtina, Kosovo, during the period January-March 2017. Analyzed data were collected from year 2015-2016, included physiotherapeutic reports of patients of both sexes, Lasegue's test and improvement of the patients after 10 sessions of physical therapy treatment. The main criteria for inclusion in the research was chronic non-specific low back pain with a duration of more than 6 months. According our results we found statistical significance difference regarding the overall condition of treatment from the total number of patients ($t=2.004$, $p<0.05$). Based on this research we can conclude that physical therapy is highly effective treatment in reducing chronic non-specific low back pain.

Key words: pain, exercises, lumbar region

Introduction

Low back pain (LBP) is a major health problem also the most common cause of disability (Garcia et al., 2013; Manek & McGregor, 2005). Low back pain is defined as any pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal fold, pain may be radiated through the leg or not. Epidemiological studies have generally considered that risk factors for starting backache are interrelated in three dimensions: individual factors and lifestyle, physical or biomechanical factors, and psychosocial factors (Maniadakis & Gray, 2000). Low Back Pain has a point prevalence of about 7 to 33% and lifetime prevalence of nearly 85%, it affects about 70-85% of individuals once in their lifetime (Unsgaard-Tondel, Fladmark, Salvesen, & Vasseljen, 2010; Al-Obaidi & Mahmoud, 2014; Davies et al., 2014; Dunsford, Kumar, & Clarke, 2011).

The purpose of this study was to evaluate the efficacy of

physical therapy in patients with chronic non-specific low back pain.

Methods

This retrospective study was conducted at the Diagnostic Therapeutic Center Rezonanca, Department of Physiotherapy in Prishtina, Kosovo, during the period January-March 2017. Analyzed data were collected from year 2015-2016, including physiotherapeutic reports of patients of both sexes, Lasegue's test and improvement of the patients after 10 sessions of physical therapy treatment.

Total number of patients included in the study was 32 with chronic nonspecific low back pain, age 17-75. These patients were treated with physical therapy. Physiotherapeutic reports were selected randomly and included in the study by analyzing the physical examination, lasegue's test and subjective evaluation after treatment regarding general condition and pain. The



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evaluation was done by physical therapist after 10 treatment sessions and the patients reported that after treatment they feel total improvement, some improvement and no improvement regarding pain and function.

Ethical clearance

The study was approved by Ethical Board of Diagnostic Therapeutic Center "Rezonanca" Prishtina, Kosovo nr. 24\14.

Treatment protocol of physical therapy

All patients were treated individually by their physical therapist. They were treated with Transcutaneous electrical nerve stimulation (TENS) 15-20 min in painful points on the lumbar region muscles, hot packs 15 min. Also deep transverse massage was applied 15-20 min, passive mobilization of lumbar vertebrae, stretching and strengthening of abdominal and back extensors.

The main criteria for inclusion in the research was chronic non-specific low back pain with a duration of more than 6 months. We have excluded patients with other pathologies like hypertension, diabetes, pregnancy etc.

Presentation of data will be done through tables. Statistical parameters would be calculated: arithmetic mean, standard deviation, and minimum and maximum values. While for parametric data, t-test will be used. Verification of tests for the degree of reliability should be 95% and 99%, respectively $p < 0.05$ and $p < 0.01$.

Results

Total number of patients included in the study was 32 with chronic nonspecific low back pain, higher frequency of age belonged to 40-49 (34.38%) while the lower frequency belonged to age group 0-19 (3.13%), regarding the sex, female patients showed with higher frequency (Table 1).

Table 1. Patients included in the study regarding age and sex

Age	Female		Male		Total	
	N	%	N	%	N	%
10 - 19	1	5.88	0	0	1	3.13
20 - 29	0	0	0	0	0	0
30 - 39	4	23.53	5	33.33	9	28.13
40 - 49	7	41.18	4	26.67	11	34.38
50 - 59	2	11.76	3	20	5	15.63
60+	3	17.65	3	20	6	18.75
Total	N	17	15	100	32	100
	%	53.1	46.9			

The total average of age (Table 2) of all participants included in the study was age 46.59 with ($SD \pm 12.42$). Regarding the gender, the average of age in all female participants was

45.29 ($DS \pm 12.35$ age) while males were slightly older aged 48.07 ($SD \pm 12.77$ years). With t-test, we found statistically significant difference regarding gender ($t = 1.699$, $p < 0.05$).

Table 2. Statistical data of parameters of age by sex

	Female	Male	Total
N	17	15	32
Mean	45.29	48.07	46.59
SD	12.35	12.77	12.42
Min	17	31	17
Max	65	73	73

t-test, p-value, $t = 1.699$, $p < 0.05$

Before treatment Lasegue test was positive at 19 patients, or (59.4%) of all patients, while negative test was seen only in 13 patients or (40.6%) of all patients (Table 3). In all

of our patients, with t-test, we found statistically significant difference regarding the presence of a positive Lasegue's test ($t = 12.70$, $p < 0.05$).

Table 3. Values of Lasegue's test before treatment by sex

Lasegue's test	Female		Male		Total	
	N	%	N	%	N	%
Positiv	8	47.1	11	73	19	59.4
Negativ	9	52.9	4	27	13	40.6
Total	17	100	15	100	32	100

t-test, p-value, $t = 12.70$, $p < 0.05$

The evaluation of patients after physical therapy treatment showed improvement in 18 patients, while relative improvement reported 10 patients and only 4 of them reported no improvement at all. Regarding our results in all of our patients with t-test, we found statistically significant difference

regarding the general condition of improvement of patient after physical therapy ($t = 2.004$, $p < 0.05$). Relation of general improvement after treatment with positive Lasegue's test was more related with group of patients who reported total improvement in 12 patients or 66.7% (Table 4).

Table 4. The evaluation of patients after treatment and correlation with Lasegue's test

Lasegue's test	After tretment						Total	
	Improvement		Relativ improvement		No improvement		N	%
Positiv	12	66.7	5	50	2	50	19	59.4
Negativ	6	33.3	5	50	2	50	13	40.6
Total	18	100	10	100	4	100	32	100

t-test, p-value, t = 2.004, p<0.05

Discussion

Low back pain is a major health problem in modern society. The condition has a high prevalence in many countries around the world (Zheng et al., 2012). In this study were included 32 patients with low back pain, they were treated with physiotherapeutic modalities and exercises. From the overall patients our results showed with higher frequency the age group 40-49 years old while regarding the gender higher frequency belonged to female group, same data reported also other authors (Y.X.J. Wang, J.Q. Wang, & Kaplar, 2016), according they systematic review of 98 researches they concluded that female subjects were with higher prevalence in all age groups, while the highest prevalence of subjects with low back pain showed to be in middle age group.

Regarding the use of modalities like TENS, ultrasound, thermotherapy according the literature they showed to have a positive effect in general improvement for patients with low back pain, in our research these modalities also had a positive impact in patients, similar data reported also other authors (Deyo, Walsh, Martin, Schoenfeld, & Ramamurthy, 1990), they reported that application of modalities like TENS in combination with exercises in patients with low back pain resulted to be very effective in pain management and improvement in daily life activities.

According our results from all 32 patients with low back pain, the evaluation of patients after physical therapy treatment showed improvement in 18 patients, while relative improvement reported 10 patients and only 4 of them reported no improvement at all. Regarding our results in all of our patients with t-test, we found statistically significant difference regarding the general condition of improvement of patient after physical therapy treatment. From these results we can conclude that beside the role of physiotherapeutic modalities a crucial role in general management of patients with LBP is also deep transverse massage, exercises for strength and stabilization of muscles in lumbar region and trunk.

There is a strong evidence about the effectiveness of therapeutic exercises for patients with LBP, some authors reported that therapeutic exercises are very effective for back flexibility, pain management and improvement of ability in daily life activities (Hayden, Tulder, & Tomlinson, 2005) (Garcia et al., 2013; Dunsford, Kumar, & Clarke, 2011; Kamali, Panahi, Ebrahimi, & Abbasi, 2014).

According our survey we can conclude that is strong evidence about the effectiveness of deep tissue massage for patients with low back pain regarding the pain and mobility, although the evidence showed that is very little confidence that massage is an effective treatment for chronic LBP (Farber & Wieland, 2016). But when massage is combined with therapeutic exercises and modalities showed to be very effective treatment for patients with chronic LBP (Bervoets, Lujisterburg, Alessie, & Buijs, 2015; Cherkin et al., 2011).

Regarding our results we can conclude that therapeutic exercises, modalities and deep transverse tissue massage are an efficient treatment protocol for patients with chronic low back pain in reducing pain and general improvement. We recomend long term surveys with control goupes and comparing with other techniques to confirm the effectiveness of treatments protocols for partients with chronic low back pain.

Our recommendation consists of educating patients regarding posture in everyday life activities, the important role of physical therapy, and the irreplaceable role of therapeutic exercises for chronic low back pain.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Sports Activities in Obese Teenagers Improve Social Inclusion and Health

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Abstract

Obesity is known to be a major risk of whole range of cardio vascular, metabolic and respiratory disorders. The etiology of obesity can be genetic, hormonal and determine the central obesity (or visceral or android). It is characterized by the deposit of fat especially abdominal and recognizable by a waist-hip ratio of more than 0.85 in women and 0.95 in 'man, and the peripheral (or subcutaneous or gynoid) that shows a ratio of less than 0.85 in women and 0.95 in men. The research was carried out in order to monitor and improve the correct use of the respiratory function of obese adolescents by developing a sports program aimed at reducing body weight and enhancing motor skills on 60 subjects (30 males and 30 females) aged between 14 and 16 years for a period of eight months. Results showed a reduction in body weight for almost all participants. For 26 subjects, the reduction was around 10%, while for others it was around 8%. Only 8 subjects did not significantly change their weight. The improvement of the motor program, on average, was about 9.5%. The phenomenon of obesity is often one of the factors of discomfort conditions in adolescence that slows down the process of social inclusion and highlights "paramorphism" that has negative effect on the respiratory function. Sport is one of the most important activities to combat the problem of weight gain because, through the rules of sports disciplines, it favors the acquisition of correct lifestyles.

Key words: obesity, sport, exercise testing, pulmonary function tests, inclusion

Introduction

Obesity is known to be one of the most important health problems in the U.S and in other countries (Oates et al., 2018; Mazzeo, 2016). The World Health Organization (WHO, 2013) predicts that, by 2015, around 700 million adults will be obese (at least 10% of the projected global population). Also, obesity is known to be a major risk of whole range of cardio vascular, metabolic and respiratory disorders (Mazzeo, 2016; Boulet, 2013.) The obese adolescent presents, in addition to the characteristics of an organic nature, mainly those of a psychological nature. The body transformation determined by age and the often negative judgments of peers frequently determine psychological problems with personality disorders and with attempts, often inappropriate, of compensation on the body of affective-relational disorders (Illiano et al., 2017). Furthermore, obesity it is often one of the factors of the conditions of

discomfort in the adolescent age that slows down the process of social inclusion and it degrades the functionality of large body systems (Salome, King, & Berend, 2010). The problematic of increasing body weight is the result of a glucidic and protidic energy imbalance (Hill et al., 2018; Wells, Noseworthy, Hamilton, Tarnopolski, & Tein, 2008) prolonged over time; in practice, children, adolescents, but also adults, introduce a surplus of calories than the body actually needs. The global approach to obesity (Mazzeo, 2016) is often difficult, caused by the multifactorial nature of the phenomenon. In the etiopathogenesis there are multiple factors, both environmental and psychological (Zametkin, 2004), both of a genetic nature (Illiano et al., 2017). The treatment of obesity cannot and should not be understood as a simple prescription of certain diets or a simple encouragement to perform motor-sports activities (Yazdani, Sharif, Elahi, Ebadi, & Hosseini, 2018).



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In the scholastic and social context, the phenomenon has assumed increasingly significant and worrying connotations since for adolescents the physical, aesthetic, and the difficulty in actively participating in a life of gratifying relationship gradually determines conditions of discomfort. In some cases of marginalization with psychosomatic repercussions that reflect on the correct use of large systems (P.B. Persson, Bondke, & A. Persson, 2018; Schenone et al., 2003). Obesity has been commonly associated with an increased risk of developing new cases of asthma. Also, it has been difficult to define the ways through which obesity affects the asthma phenotype in children and adolescents (Farah & Salome, 2012). Epidemiological data showed that obesity has various effects on respiratory system and seems to be a predisposing factor for the development of asthma and leads the development of asthma raises (Perrotta, Mazzeo, & Cerqua, 2017). Obese patients with asthma more symptoms and increased morbidity compared with non-obese asthma patients (Boulet, 2013; Matera, Rinaldi, Calzetta, & Cazzola, 2017). The major respiratory complications of obesity contain a heightened demand for ventilation, elevated work of breathing, respiratory muscle inefficiency and diminished respiratory compliance (Parameswaran, Todd, & Soth, 2016).

Furthermore, study showed that the physical activity such as aerobic or anaerobic exercise alters the respiratory parameters on obese population. Obese can intensely alter pulmonary function and diminish exercise capacity by its adverse effects

on respiratory mechanics, resistance with in the pulmonary system, respiratory muscle function, lung volumes, work and energy cost of breathing, and gaseous exchange (Luce, 1980; Mazzeo 2016). In the population, the widespread tendency of adolescents to be overweight or obese, and this number is continuing to rise, exposed the Children have fewer weight-related health and medical problems than adults. However, overweight children are at high risk of becoming overweight adolescents and adults, placing them at risk of developing chronic diseases such as heart disease and diabetes later in life. They are also more prone to develop stress, sadness, and low self-esteem (Mazzeo, 2016). In obese people the benefits of various forms of physical activity and response with long term follow up need to be further assessed (Salome et al., 2010).

The diagnosis of obesity, in addition to the irrefutable objective examination and body weight, is carried out in relation to the concept that the human body consists of two compartments:

- fat mass (FM=fat mass): consisting of all body lipids distributed in the subcutaneous and visceral tissues;
- lean mass (FFM=free fat mass): consisting of muscle mass, bone and inter and intra-parenchymal non-adipose tissues.

The concept of fat mass and lean mass is substantiated in the identification of specific indexes of reference, BMI or IMC, which are calculated through pre-established formulas, $BMI = \text{weight (kg)} / \text{stature (m)}^2$, whose results provide ranges (Tables 1 and 2) which determine the categories at risk.

Table 1. Reference range of the values of the IMC

INDEX	VALUE	CONDITION
IMC	<18	situation of underweight
IMC	18.5-25	optimal weight situation
IMC	25.1-30	overweight situation
IMC	30.1-40	obesity situation
IMC	>40	situation of severe obesity

Table 2. Reference range of the values of the BMI

INDEX	VALUE	CONDITION
BMI	24.9	upper limit of normality
BMI	25-29.9	obesity of the first degree
BMI	30-39.9	obesity of the second degree
BMI	>40	WWobesity of the third degree
IMC	>40	situation of severe obesity

To investigate the effect of obesity on respiratory system, most researches used values of pulmonary function test (PFT). The spirometry tests measured were the forced vital capacity (FVC), forced expiratory volume in one second (FEV1), peak expiratory flow rate (PEFR) and forced mid-expiratory flow (FEF 25-75%) and ratio of FEV1 to FVC was calculated to find the impact of obesity on ventilation. But most of the studies focus on FEV1, minute ventilator volume and ERV. Obese children have more respiratory symptom than their normal weight peers.

Method

The study carried out, with an observational method, on a sample of 60 subjects, 30 men and 30 women, aged between 14 and 16 years with a body weight of between 65 kg and 80 kg. The specific objective of the research, was to verify the im-

provement of the inclusion and the reduction of body weight, thought the execution of two hours of extra weekly extracurricular training. The activity performed in an indoor plant taking care the strengthening of the coordinative abilities, in particular of the oculo-manual and oculo-podalica coordination, of the spatio-temporal organization and of the rhythm as well as of the ability to work in groups (Comoglio & Cardoso, 1996) through the use of team sports disciplines. All 60 subjects participated frequently in additional training sessions.

At the beginning and at the end of the sports route, motor tests were administered (Marella & Risaliti, 2007) to monitor not only the reduction of body weight, but also progress on the use of coordination skills (Magni, 2009) and conditional (Montesano et al., 2013) and the parameters of respiratory function as spirometry.

Additional training

The sporting path was developed with four training sessions weekly, each carried out on different days, two of which in the morning hours and two in the afternoon. During the first fifteen days interviews centered on the knowledge of correct eating habits and on the importance of sporting activity in adolescence were carried out and only the anti-daily sessions were held (Montesano, 2018).

In the following months, all four sessions were carried out, increasing the duration in the afternoon sessions (average from 30-45 min to 55-70 min) and the intensity of the activity. In a standard work session the intensity should be low at least for the first fifteen minutes, with a steady and steady heart rate and a continuous and regular oxygenation. In fact, aerobic training, in addition to the direct consumption of fats, induces positive changes in the basal metabolism; greater resistance in the activities of daily life; greater resilience after every type of effort; a greater supply of blood to the brain and muscles; a regularization of arterial pressure; a regularization of the pulse frequency. The coaching sequence was carried out with 10 'of slow running, 8' of mobilization exercises, 3 'of respiratory gym exercises, 12' exercises with the use of small tools and with small weights, 6 'of abdominal exercises and backbones, 10 'ball games, 3' of stretching exercises, 8 'of slow running (Montesano, 2016).

The exercises were set up with the concept of work in progress organizing work paths alternating coordinative and

conditional exercises. The organization of work in circuits has provided for the enhancement of oculo-manual and oculo-podolica coordination, organization of space, rhythm, the specific technique of the most common team games such as basketball, football (Montesano, 2016) , volleyball, handball. The exercises were initially performed at natural load using balloons, cones, rods, carpets, elastics, circles. Only from the fifth month were introduced medicinal flasks, ballasted anklets and other small tools. There were also sessions dedicated to free play. These sessions were preparatory to those that, developed during team games, stimulated the issues of collaboration, the development of unforeseen gaming situations, with the related strategies to be adopted for the resolution of the problems present during a race also through breathing control.

Materials and resources: 1) Indoor Stadium; 2) Small tools (Clavette, supports, circles, sticks, elastics); 3) Basketball and soccer ball; 4) 1,2,3,5 kg medicinal ball; 5) 1.2 and 3 kg weights; 6) Ballasted anklets of 1,2,3, kg; 7) Detection grids; 8) Spirometer

Results

The results were elaborated by measuring, at the beginning and at the end of the research path, the weight of the participants, highlighting the initial and final average weight measured after eight months of activity.

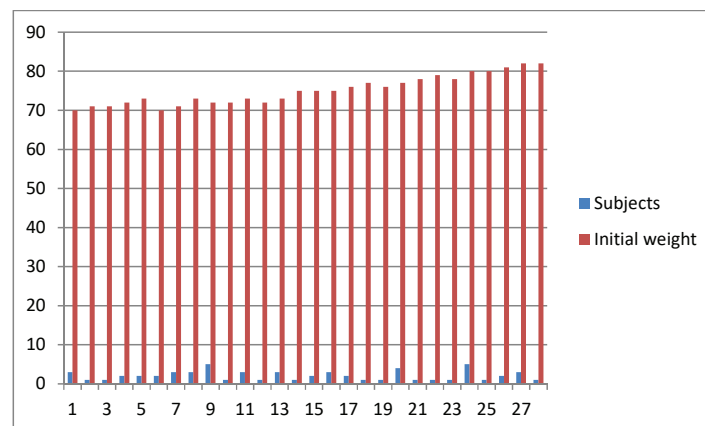


Figure 1. Initial detection average weight 60 subjects

The average reduction in body weight was around 9%. Twenty-six subjects decreased their weight by about 10% while sixteen subjects decreased it by 8%. Only eight subje-

cts did not register significant weight variations. Research has shown a reduction in kg (Figure 1 and 2).

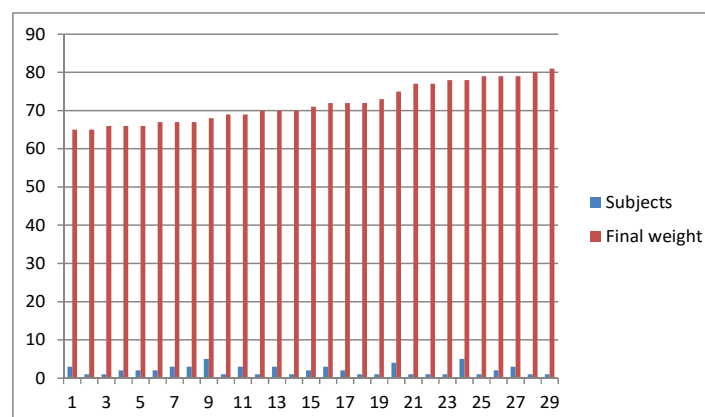


Figure 2. Final detection average weight 60 subjects

This is more favorable for men than for women. The comparison between initial and final weight showed (Table 3, Figure 3) that only three subjects did not benefit from weight reduction while the other fifty-seven showed reductions in body weight.

Table 3. Comparison between initial and final weight

Number of Subjects	Initial weight	Final weight
3	70	65
1	71	65
1	71	66
2	72	66
2	73	66
2	70	67
3	71	67
3	73	67
5	72	68
1	72	69
3	73	69
1	72	70
3	73	70
1	75	70
2	75	71
3	75	72
2	76	72
1	77	72
1	76	73
4	77	75
1	78	77
1	79	77
1	78	78
5	80	78
1	80	79
2	81	79
3	82	79
1	82	80
1	81	81

At the end of the course, the participants were interviewed again and everyone declared that the experience produced positive effects both from an aesthetic and functional point of view, and from the aspect of breathing control that reduces the manifestations of anxiety.

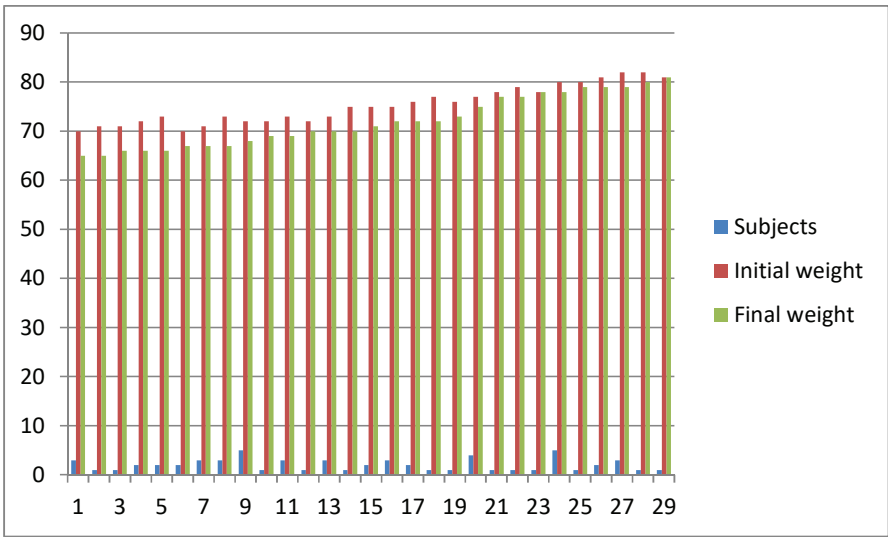


Figure 3. Comparison between initial and final weight

Discussion

The drafting of a suitable sporting work path is based on the knowledge of the condition of subjects at risk of obesity (the daily human lipid energetic requirement is between 0.8 - 1.2 gr/kg of body weight while the glucide is between 100 - 150 gr/kg of body weight). Furthermore, on the awareness that the physical-sport activity, carried out in a continuous and regular way, induces benefits effects on weight control, on the regulation of energy expenditure, on cardio-circulatory and respiratory function (Mazzeo, 2016). Most of the studies showed that there was a direct improvement on respiratory parameters in obese people either with aerobic or anaerobic exercise (Vengata, Ganesh, & Wan Rosley, 2014). Benefit showed also on the functionality of the osteoarticular and muscular structures, on the capacity for coordination and dexterity, on the structuring of character, self-control and self-esteem (Ruiz et al., 2010) (Table 3). A healthier body means feeling good about yourself. The fragmentation and the lack of synergy of the interventions, such as the prescription of a diet or the generic invitation to the performance of a not well identified physical activity, do not meet the appropriate requirements for the treatment of obesity. The multidisciplinary approach, oriented to monitoring pathology and ongoing support, represents the appropriate path to be pursued to obtain effective results (Montesano & Mazzeo, 2018).

At a general level, the physical activity performed regularly and lasting at least thirty minutes a day, combined with an adequate diet, determines, in a medium-long period, an increase in energy expenditure and therefore a corresponding decrease in fat (Mazzeo, 2016; Mazzeo et al., 2018). In the scholastic context, a condition in which learners spend long hours seated, it is necessary to balance this indication with curricular and extra-curricular activities that favor aerobic and low intensity activities but, above all, group activities that foster peer relationships. The condition of adolescent obesity is a widespread problem within the social and educational community. The dynamics of the developmental age are amplified if the adolescent is affected by obesity and the good motor practices can be the key to obtaining an effective inclusive result. It is therefore necessary that health be protected through movement and to the benefits that physical activity induces both to maintain an adequate psychophysical balance and to maintain restore compromised functionality (Montesano et al., 2013). The study conducted on a sample of 60 adolescents showed, therefore, the effectiveness of physical activity, related to a correct dietary style, to reduce, even significantly, excess weight with benefits in relational and collaborative behaviors (Comoglio & Cardoso, 1996). The best results were recorded among male subjects compared to females. The correct physical activity has shown a greater mastery of the respiratory function whose final parameters have improved significantly (Sandip, Murnal, & Yuganthi, 2012). Intensity training, talent, and an adequate diet represent the crucial factors for the success of athletes and our children (Mazzeo et al., 2016). It is important to educate the adolescent to pursue appropriate lifestyles with the correct use of bodily functions and food hygiene through the exercise of sports activity (Mazzeo et al., 2016; Vengata et al., 2014). A number of strategies (educative and persuasive, facilitative and restrictive) have been proposed to improve the lifestyle to our children. (Mazzeo et al., 2005; Mazzeo et al., 2018). This study is a good starting point for future work in this area of research and in this direction we are going on.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

How Do You Watch Sports? Differences on Credibility, Viewing Satisfaction, Flow, and Re-viewing Intention between Public TV Stations and One-person Media via SNS

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Abstract

With advancements in the Internet and next-generation devices, one-person media sports broadcasts cause major changes in the sports broadcasting field, dominated by large TV broadcasting stations. The popularity of one-person media, especially among sports fans, and the presence of “influencers” with considerable impact are tremendous in the sports industry. In this context, this study assessed factors that drive media viewing based on (a) credibility, (b) viewing satisfaction, (c) flow, and (d) re-viewing intention. This study also analyzed recent sports media consumption patterns by comparing one-person media sports broadcasts with existing public TV broadcasts. The study results showed that mass appeal, flow, satisfaction with commentaries, satisfaction with video and sound, and satisfaction with the information provided significantly effect viewers’ intent to re-view broadcasts in the future. Although existing TV broadcasts have more professionalism, trustworthiness, and mass appeal than one-person media, the latter provides more dynamism, satisfaction with video and sound, satisfaction with information provided, flow, and re-viewing intention. These study results indicate that rather than being a temporary trend, one-person media sports broadcasts obtained positive reactions in terms of re-viewing intention, based on high satisfaction and viewing flow of viewers, which are noteworthy in the sports media field.

Key words: *broadcasting, one-person media, credibility, viewing satisfaction, flow, reviewing intention*

Introduction

In the sports field, which has many ardent fans, the Internet has provided many benefits in different ways to those who develop and produce sports products and those who consume these products (Sutton, 2011). The sports broadcasting industry is known as among the largest industries in the sport field; its scale continues to grow (Mullin, Hardy, & Sutton, 2014). The scale of sports broadcasting rights, or the right to bro-

adcast sports games through media, is increasing by the day, along with the popularity of sports. Specifically, advertisement revenue, the merchandising industry, and other related businesses improved by pro sports broadcasting rights play an important role in the growth of the broadcasting rights industry (Horky, Clavio, & Grimmer, in press).

Because the easiest way to consume sports is to watch sports broadcasts, it is necessary to study the consumption



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tendency of sports media viewers (Seo & Green, 2008). Moreover, as the use of smartphones and other smart devices intensifies, viewers are no longer limited to watching sports through their TV at home; they can now watch live streaming of sports from different parts of the world in the palm of their hands, anytime and anywhere (Kang, 2015). This type of consumption was unimaginable for viewers in the past but has only become possible through the Internet and smart devices.

Another recent change in the sports broadcasting field is deeply connected to the growth of one-person media. Specifically, instead of a professional broadcaster, an individual creates and produces his/her own content through a personal blog or YouTube, and people across the world consume such content while chatting with the producer in real-time (Bloom, 2006). The spread and popularity of one-person media threatens public TV broadcasts; its ripple effect and influence have caused creators of one-person media broadcasts to be called "influencers" (Cho, 2011). The era of unilateral delivery of media products has long been over, and those that enable communication between producers and consumers have become the standard (Gohar, Mehmood, & Sair, 2016).

In all sports broadcasts, including one-person media, the agent who broadcasts sports events and commentates on the game significantly impacts consumer choice (Kim, 2005). Moreover, because high ratings are closely related to profits from advertisements played during a sports broadcast, (a) a commentator's public confidence, (b) viewer satisfaction after watching a broadcast through media, (c) flow while watching a broadcast, and (d) a viewers' re-viewing intention are extremely important factors in analyzing sports media. These factors are required in an analysis given that in the new trend of one-person media format, regular individuals, instead of professionals commentating on sports broadcasts from public TV stations, are responsible for making commentaries.

First, credibility is defined as skills and reputation in providing a trustworthy, reasonable evidence (Berlo, Lemert, & Mertz, 1969; Meyer, 1988). Since this reasonable evidence is delivered through a message, a credible message is closely related to the messenger of that message (Davis & Krawczyk, 2010). Therefore, the commentator who delivers the intended message may be regarded as the most important factor in gaining public confidence or in the commentary of a sports broadcast. In the existing media, public confidence in a media broadcast is gained by recruiting professional commentators with a good reputation and who deliver high-quality broadcasts (Kim, 2005).

The concept of satisfaction is most important in not only the sports media industry but also all industries, because it is determined through the product that provides satisfaction or the quality of service; next to consumption, it is a factor that offers the most absolute impact on consumer behavior (Churchill & Surprenant, 1982). Therefore, consumer satisfaction is often defined as an overall evaluation after the completion of consumption (Fornell, 1992). In examining an individual's satisfaction, many popular arguments say that initial expectation or prior experience must be compared against post-consumption experience (J. W. Kim, Magnusen, & Y. K. Kim, 2014; Olson & Dover, 1979). Tse and Wilton (1988) also supported the fact that consumer satisfaction/dissatisfaction is determined by disparity between initial expectation and perceived performance after consumption. Viewer satisfaction is also among the most important concepts in the sports broad-

casting field and may be explained as the overall evaluation after one consumes the media content.

As the popularity of sports increases and with the creation of an environment where fans can watch sports games from across the world without restrictions, a sports broadcast must provide ardent fans with the experience of being at the actual game (Wenner & Billings, 2017). Hence, the degree of flow through media inevitably becomes an important aspect of sports media (Park, 2011). The concept of flow refers to a state of extreme psychological entertainment or an individual's engagement in a certain task, and has characteristics, such as strong focus, loss of self, or a skewed sense of time (Csikszentmihalyi, 2000; Hamilton, Kaltcheva, & Rohm, 2016). In other words, this means that fans become engaged in a sports broadcast, are unable to focus on other tasks, or do not feel that time is passing by because of their intense concentration (Park, 2011; Pynta et al., 2014). When this phenomenon is applied to the sports broadcasting field, intense flow has a positive impact on re-viewing intention.

Ultimately, re-viewing intention can be described as people's intent to watch something again when they have a positive experience with the content and quality of the media (Kang, 2016). Continuous viewing intention is an extremely important core factor in viewers within the fiercely competitive sports broadcasting field. Further, for one-person media sports broadcasting to secure more viewers and expand its range, it is important to analyze the degree of re-viewing intention among viewers. Meanwhile, sports broadcasting that uses the same media platform as TV must examine the re-viewing intention of viewers to assess the current situation.

Research purpose and questions

Therefore, the purpose of this study is to examine factors that drive media viewing based on (a) viewing satisfaction, (c) flow, and (d) re-viewing intention, and to analyze the consumption patterns of recent sports media by comparing one-person media sports broadcasts with existing public TV broadcasts. The following two research questions were designed based on these purposes.

RQ1. What factors on credibility, viewing satisfaction, and flow of sport broadcasting drive re-viewing intention?

RQ2. What are the differences in credibility, viewing satisfaction, flow, and re-viewing intention between one-person media sport broadcasting and public television sport broadcasting?

Methods

Participants

This study conducted a survey on individuals who watched soccer broadcasts from the 2018 FIFA World Cup Russia. This survey was conducted in the plaza in front of two different shopping complexes located in Seoul, South Korea, which have large floating populations; the survey targeted people who watched sports broadcasts through public TV or one-person media broadcasts on the Internet for a period of one month starting from when the World Cup began and ended, or from June 14 to July 16, 2018. All respondents voluntarily filled out the survey through a self-administration method.

Measures

The scale used in the study by Noe (2007) regarding the public confidence of soccer broadcast commentators and

showing acceptable reliability (Cronbach's alpha level of 0.714 to 0.858) were revised and used accordingly. The four subfactors, namely, (a) expertise (4 items), (b) trustworthiness (4 items), (c) dynamism (3 items), and (d) mass appeal (3 items) had a total of 14 items measured on a 5-point Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree").

The scale used by Noe (2007) and Park (2011), who studied the psychology of consumers who watch soccer broadcasts, was revised and used accordingly. In more detail, there were three subfactors, namely, (a) satisfaction with the commentary ($\alpha=0.821$, 4 items), (b) satisfaction with video and sound ($\alpha=0.887$, 4 items) and (c) satisfaction with information delivery ($\alpha=0.867$, 3 items). The scale had a total of 11 items. Each question was measured on a 5-point Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree").

To measure the flow of viewers while watching a broadcast, the scale with an acceptable Cronbach's alpha result ($\alpha=0.836$) in the study by Cho (2018), which analyzed motivation for using one-person media and flow, was revised to suit this study and used accordingly. This scale included 3 items. Each question was measured on a 5-point Likert scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree").

Lastly, to measure re-viewing intention of viewers, the scale used in the study by Noe (2007) ($\alpha=0.874$) was revised and used accordingly. This scale included 3 items. Each question was measured on a 5-point Likert scale, ranging from 1

("Strongly disagree") to 5 ("Strongly agree").

Data analysis

To verify the factor structure of the research instruments, an Exploratory Factor Analysis (EFA) was performed, using Principal Component Analysis (PCA) with Varimax rotation. Additionally, to ensure internal consistency of the scores from the instruments, Cronbach's alphas were utilized. After these processes, a multiple regression analysis was conducted to verified cause-and-effect relationships of variables and a multivariate analysis of variance (MANOVA) was conducted to compare and analyze the differences in credibility, viewing satisfaction, flow, and reviewing intention of sports broadcasts between existing public television broadcasts and one-person media.

Results

Descriptive statistics

A total of 450 surveys were distributed, and 344 were returned (approximately 76.4% of response rate). After excluding 31 incomplete surveys, 309 surveys were finally utilized in this study. According to the viewing experiences in sports broadcasts, the current study categorized survey respondents into two groups: (a) public television broadcasts ($n=143$, 46.3%) and (b) one-person media ($n=166$, 53.7%). More detailed information for demographics was shown on Table 1.

Table 1. Frequency of Distributions for Demographic Variables

Groups	Group 1 (Public television broadcasting)	Group 2 (One-person media)
Media	($n=143$, 46.3%)	($n=166$, 53.7%)
Gender	Male ($n=91$, 63.6%)	Male ($n=96$, 57.8%)
	Female ($n=52$, 36.4%)	Female ($n=70$, 42.2%)
Age	20s ($n=48$, 33.6%)	20s ($n=74$, 44.6%)
	30s ($n=39$, 27.3%)	30s ($n=50$, 30.1%)
	40s ($n=34$, 23.8%)	40s ($n=25$, 15.1%)
	50s ($n=22$, 15.4%)	50s ($n=17$, 10.2%)
Education	Hight school ($n=47$, 32.9%)	Hight school ($n=60$, 36.1%)
	Bachelor ($n=86$, 60.1%)	Bachelor ($n=89$, 53.6%)
	Graduate ($n=10$, 7%)	Graduate ($n=17$, 10.2%)

Scale validity & reliability

The exploratory factor analysis using the PCA with Varimax of Credibility (4 factors, 14 items), Viewing satisfaction (3 factors, 11 items), Flow (3 items), and Reviewing intention (3 items) was conducted. The Kaiser Meyer-Olkin measure identified the sample adequacy for the analysis, $KMO=.736$ (Field, 2009). Barlett's test of sphericity ($\chi^2=4226.733$, $df=465$, $p<.001$) was statistically significant. Extracted 9 factors had eigenvalues greater than 1 and factor structure coefficients greater than .40.

The factors accounted for 69.79% of the total variance.

All Cronbach's alphas showed acceptable internal consistency for reliability based on the .70 cutoff (Nunnally & Bernstein, 1994): (a) Credibility (Expertise, $\alpha=.749$; Trustworthiness, $\alpha=.733$; Dynamism, $\alpha=.801$; Mass appeal, $\alpha=.735$), (b) Viewing satisfaction (Commentary, $\alpha=.798$; Video and sound, $\alpha=.874$; Information delivery, $\alpha=.841$), (c) Flow ($\alpha=.868$), (d) Reviewing intention ($\alpha=.887$) (Table 2).

Table 2. Factor Structure Matrix for Variables and Reliability

	1	2	3	4	5	6	7	8	9
VS4	.897								
VS1	.831								
VS3	.828								
VS2	.816								
CO4		.826							
CO1		.807							

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	1	2	3	4	5	6	7	8	9
CO3		.804							
CO2		.696							
RI1			.915						
RI2			.902						
RI3			.825						
FL1				.915					
FL3				.896					
FL2				.786					
EX4					.819				
EX1					.750				
EX2					.712				
EX3					.680				
IN3						.932			
IN1						.889			
IN2						.747			
TR4							.769		
TR1							.763		
TR2							.726		
TR3							.660		
DY1								.851	
DY3								.829	
DY2								.750	
MA3									.886
MA1									.832
MA2									.660
E-VALUE	4.863	3.098	2.707	2.143	2.029	1.985	1.734	1.644	1.433
VARIANCE (%)	15.69	9.99	8.73	6.91	6.54	6.40	5.60	5.30	4.62
α	.874	.798	.887	.868	.749	.841	.733	.801	.735

Legend: VS=Satisfaction with video and sound, CO=Satisfaction with the commentary, RI=Reviewing intention, FL=Flow, EX=Expertise, IN=Satisfaction with information delivery, TR=Trustworthiness, DY=Dynamism, MA=Mass appeal.

Multiple regression

As results of the multiple regression, the regression model had an explanatory power with the following result: $F=5.646$, $p=.000$, $R^2=.131$ explaining 13.1% of the variance. More specifically, (a) Satisfaction with video and sound ($t=2.637$, $p=.009$), (b) Satisfaction with information delivery ($t=2.584$,

$p=.010$), (c) Satisfaction with the commentary ($t=2.457$, $p=.015$), (d) Flow ($t=2.403$, $p=.017$), and (e) Mass appeal ($t=1.993$, $p=.047$) factors in sports broadcasts increased reviewing intention of sport fans, whereas the rest of variables was not statistically significant (Table 3).

Table 3. Results of Multiple Regression

MODEL		B	SE	β	t	p
		.546	.578		.944	.346
CREDIBILITY	expertise	-.138	.085	-.095	-1.633	.104
	trustworthiness	.099	.091	.062	1.089	.277
	dynamism	.029	.071	.025	.413	.680
	mass appeal	.140	.070	.110	1.993	.047*
VIEWING SATISFACTION	commentary	.183	.075	.135	2.457	.015*
	video and sound	.170	.064	.146	2.637	.009**
	information delivery	.155	.060	.143	2.584	.010*
FLOW		.144	.060	.137	2.403	.017*

Legend: * $p<0.05$, ** $p<0.01$.

Multivariate Analysis of Variance (MANOVA)

The multivariate test indicated statistically significant differences based on the forms of media (Public television broadcasting and One-person media) [Wilks' lambda=.455, $F(9, 204)=39.758$, $p=0.00$, partial $\eta^2=.545$]. Based on adjusted alpha

Table 4. Results of MANOVA: Differences in Credibility, Viewing Satisfaction, Flow, Reviewing Intention between Two Groups Based on Media

SOURCE	DV	df	F	p	η^2
CREDIBILITY	expertise	1	95.421	.000***	.237
	trustworthiness	1	58.457	.000***	.160
	dynamism	1	102.395	.000***	.250
	mass appeal	1	31.545	.000***	.093
VIEWING SATISFACTION	commentary	1	1.376	.242	.004
	video and sound	1	31.166	.000***	.092
	information delivery	1	18.999	.000***	.058
FLOW		1	39.830	.000***	.115
REVIEWING INTENTION		1	18.772	.000***	.058

Legend: *** $p<0.001$.

However, the rest of the tests were not statistically significant: (a) Satisfaction with the commentary as shown in

level using Bonferroni correction ($P=0.05/9=.006$), univariate tests for (a) Expertise, (b) Trustworthiness, (c) Dynamism, (d) Mass appeal, (e) Satisfaction with video and sound, (f) Satisfaction with information delivery, (g) Flow, and (g) Reviewing intention were statistically significant.

Tables 4 and 5.

Table 5. Mean Scores of Variances between Groups

	1	2	3	4	5	6	7	8	9
G1	3.205	3.184	2.433	3.175	2.816	2.573	2.646	2.492	2.527
G2	2.434	2.611	3.398	2.622	2.929	3.170	3.155	3.231	3.076

Discussion

What factors drive re-viewing intention?

The emergence of one-person sports broadcasts has gained popularity among rapidly changing viewers and is becoming a new way to watch and enjoy sports (Bloom, 2006; Cho, 2011). The results of this study showed that re-viewing intention is influenced by three factors related to viewing satisfaction (e.g., satisfaction with commentary, video and sound, and the information provided), mass appeal related to public confidence, and flow.

As mentioned above, this finding is consistent with research results arguing that the psychological factor of satisfaction has the strongest impact on the continuous behavior of consumers, as shown in previous studies (Kim et al., 2014; Park, 2011). Such results are not different from typical consumption behaviors of purchasing one out of countless products, which is expected in a situation where viewers must select and watch one media product from the many different channels that exist (Pedersen, Laucella, Kian, & Geurin, 2017). Next, although mass appeal affects how viewers select media out of factors related to public confidence, it is implied that factors, such as expertise, trustworthiness, and dynamism, which used to be important factors in sports broadcasts by public TV stations (Hayes & Carr, 2015; Spence, Lachlan, Edwards, & Edwards, 2016), were unable to have a significant effect. Meaning, viewers focus on the depth of the commentator's relationship with viewers, rather than their skills, competence, or passion. Further, the recent popularity of one-person sports broadcasts, which enable a two-way communication through real-time chatting (Bloom, 2006; J.H. Kim & B.H. Kim, 2017), means that viewers regard mass appeal with importance, which is related to the results of this study. Lastly, flow also had a significant effect on re-viewing intention, which is consistent with the results of previous studies that found satisfaction and flow

to have a major impact on the psychology of viewers (Csikszentmihalyi, 1990; Park, 2011; Pynta et al., 2014). Considering how sports occur in real-time with unexpected results (Mullin et al., 2014), flow is inevitably an important factor.

What are the differences between the two media?

Through a comparative analysis, this study found that widely popular one-person media sports broadcasts communicate more with viewers than TV broadcasts do. As mentioned above, these results showed that the presence of influencers, which refer to individuals with a major impact on the Internet or social media, is not a temporary trend but, rather, may become another field of media that can draw the interest of viewers and satisfy their demands.

First, public TV sports broadcasts were rated higher in terms of factors related to public confidence (expertise, trustworthiness, and mass appeal), which is consistent with arguments that broadcast stations are making efforts to recruit competent and professional commentators (Spence et al., 2016; Harris, 2012; Hayes & Carr, 2015). Meanwhile, because the influencers of one-person media provide more informal broadcasts than the commentators of public TV broadcasts do (Bloom, 2006; Cho, 2011; Lee, 2018; J.H. Kim & B.H. Kim, 2017), the former are rated higher in terms of dynamism. However, sports broadcasts by existing broadcast stations obtained more positive reaction in terms of the overall evaluation related to public confidence.

Next, based on factors related to satisfaction, viewers were more satisfied with one-person media broadcasts in terms of satisfaction with video, sound, and information provided. This finding has significant implications. Since most one-person media broadcasts are created by an individual who is usually not an expert (Thompson, Martin, Gee, & Geurin, 2017), the video, sound, and informative power of these broadcasts were

not expected to compare with that of large broadcast stations, but the results proved differently. It shows that the quality of broadcasts that can be provided by individuals has improved through advancements in digital equipment using the Internet, and that these people can greatly improve their informative power by using the Internet that is full of information (Blank & Lutz, 2018). Such results imply that the limitations of one-person media are slowly diminishing with the advancements in the Internet, and changes are to be anticipated in the future of sports media. In addition, there was no significant difference in satisfaction regarding commentaries.

Lastly, regarding flow and re-viewing intention, viewers were more responsive to sports broadcasts from one-person media than public TV broadcasts. The fact that one-person media provide more diverse content instead of being limited to sports broadcasts (Bloom, 2006; J.H. Kim & B.H. Kim, 2017), it is expected to increase the flow of viewers more so than public TV broadcasts do. This may be seen as an advantage of the media that use the Internet. TV broadcasts need to increase the flow of their viewers by developing more diverse content. As mentioned in the results above, since one-person media is already highly rated in terms of satisfaction and flow, which are closely related to re-viewing intention (Csikszentmihalyi, 1990; Noe, 2007; Park, 2011), it is expected that this platform will be highly rated in terms of re-viewing intention. However, rather than seeing this as a simple outcome, it must be understood that this means there may be more consumers who will continue to watch one-person media broadcasts in the sports media market.

Limitations and Future Study

This study found significant results related to the population of one-person media sports broadcasts and the viewing patterns of sports fans. However, this study is not without its limitations. First, even though the survey respondents often watched both sports broadcasts through the TV and one-person media, they were forced to select one of the two media platforms. Therefore, future studies must analyze more types of viewers and add and analyze more diverse factors that were not included in this study.

Also, this study included everyone who watched broadcasts from countless influencers who offer sports broadcasts through one-person media. However, because TV sports broadcasts are only broadcasted by a few large stations with broadcasting rights vis countless individuals who can broadcast sports through one-person media, it is impossible to know the content of each individual's broadcast. Hence, future studies must filter out influencers with a more mass appeal and deduce more accurate research results based on analyses on influencers' broadcast content.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Gender Difference, Nutritional Supplements and Drug use in Sport to Enhancing Performance: an Italian Revision over the Last Decade

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Abstract

In last years, there has been a multitude of studies on doping, such as in recreational and in amateur sport. The extent of this phenomenon was clarified for special populations (like e.g. bodybuilders) and for special substances (mostly for anabolic steroids). Doping is present in sportsmen and women; the reasons why may be many and various. The aim of this study is to discover the gender disparity of drugs addiction as doping practice and breakdown by sport bodies and gender. The data show the anti-doping test took place on Italian professional athletes during the last years: from 2007 to 2017. Data showed are originated from the report commissioned by the Italian Ministry of Health. About checked doped athletes there are significant gender differences in doping attitude and/or in doping profiling. First of all, males seem to be more exposed to doping than females. The prohibited substances most frequently used by females athletes are diuretics and masking agents (10 athletes in 2014), cannabinoids (5 in 2007) and stimulants (5 in 2011) compared to males athletes who use mostly anabolic agents (27 in 2017), cannabinoids (20 in 2012) and diuretics and masking agents (17 in 2011 e 2014). The addiction of doping substances, depends on various factors related to gender, but what drives men and women is the sense of gratification and ego orientation. Nowadays a significant number of women joined official and Olympic competitions. Doping to enhance female sport performances took importance from the two last decades of the past century.

Key words: *drugs, illicit substances, sport, gender, anti-doping controls, anti-doping programme*

Introduction

Since ancient times, men have tried to improve their performance. The reasons have changed over time. In the past, in fact, man tried to get better results in hunting. Subsequently, with the birth of fighting and competitions, the goal was to achieve greater economic profits (Mazzeo, 2016).

At the beginning, the substances used had natural or animal origins. Indeed, the Greek wrestlers and the Roman gladiators attempted to improve their own performance by taking mixtures of various types of plants or by eating sheep's testicles (Mazzeo & Raiola, 2018). But over time, artificial substances and methods were also used (Sjoqvist, Garle, & Rane, 2008; Thevis & Scanzer, 2014). In fact, the doping's stakeholders have

always been able not only to identify new substances and new methods but also to steal the new scientific discoveries aimed at the treatment of diseases, for their illegal purposes (Council of Europe, 1989). Doping is a big dimension problem due to the extensive connections between the people involved in the network. It involves the whole society (Mazzeo et al., 2018): not only elite athletes but amateurs too, their friends and relatives, the medical staff, manager, chemists, biologists and pharmacists, pharmaceutical industries, clandestine laboratories, and criminal organizations (Møller & Dimeo, 2014; Marclay, Mangin, Margot, & Saugy, 2013; Mazzeo et al., 2018). Moreover, it includes "ordinary people" too who dope for recreational or aesthetic purposes (Thevis & Scanzer, 2014).



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In the early 1900s it was realised the doping's dangerousness. In 1928, in fact, the International Association of Athletics Federations became the first International Sport Federation to ban the use of stimulating substances (Valkenburg, de Hon, & van Hilvoorde, 2014) and in 1968 drug tests were introduced at the Olympic Winter Games in Grenoble and in Olympic Games in Mexico (Kayser, Mauron, & Miah, 2005; Botrè, 2008). The ban on doping substances and the introduction of anti-doping tests have certainly represented an important tool for the fight against doping but this was not enough (Dvorak et al., 2014). It was necessary create an independent organization with the sole purpose to defeat the doping in the sport (WADA, 2010; Mazzeo et al., 2018; Overbye, Knudsen, & Pfister, 2013). For this reason, in 1999, it was created the World Anti-Doping Agency (WADA), an international organization, with the aim to promote, coordinate, and monitor the fight against doping in sport in all its forms (Mazzeo et al., 2018; Santamaria, 2016).

In accordance with the WADA Code doping is the presence of a prohibited substance or its metabolites or markers banned; the use or the attempted use of a prohibited substances or a prohibited method; the refusing or the failing, without compelling justification, to submit to sample collection; the violation of applicable requirements regarding athlete availability for out-of-competition testing; the tampering or the attempting to tamper with any part of doping control; the possession of prohibited substances and prohibited methods; the trafficking or the attempted trafficking in any prohibited substance or prohibited methods; the administration or the attempted administration to any athlete of any prohibited methods or prohibited substances, or the assisting, the encouraging, the aiding, the abetting, the covering up or any other type of complicity involving an anti-doping rule violation or any attempted anti-doping rule violation (WADA, 2010). Moreover, WADA has officially listed the banned substances and practices. This list is constantly updated (Mazzeo et al., 2018).

In last years, it is evident that prevalence of studies on doping, focus on recreational and in amateur sport, taking into consideration only certain substance classes or special sport populations. This studies can only provide limited estimates of the prevalence within the total population (Frenger, Pitsch, & Emrich, 2016).

The early years of the twentieth century are generally represented as a period of triumph for women's sports, with the eventual acceptance of a significant women's programme in the Olympics in 1924 and the proliferation of national organisations for women's sport (Heggie, 2010). So, the desire to win apparently became so pressing for some nations that deliberate and systematic cheating took place in both the men's and women's events. Therefore, doping is present in sportsmen and women; the reasons why may be many and various but doping and gender fraud became central concerns in the late 1950s

and 60s, resulting in the eventual introduction of systematic testing for both at international sporting events in the late 1960s (Heggie, 2010; Mazzeo et al., 2018).

In Italy, doping is banned according to the national Law no. 376/2000 "Regulation of health standards in sports activities and the fight against doping" too. The law established a particular Committee, "Committee for the Monitoring and Control of Doping and the Protection of Health in Sporting Activities", with the main aim of identifying the classes of prohibited substances and the competitions to be monitored, determining the conduct of anti-doping controls, promoting information campaigns for the protection of health in sporting activities and prevention of doping. Since 2003, every year the above mentioned Committee, elaborates and transmits a report containing detailed data on the spread of doping in Italy as well as activities to prevent and combat the phenomenon (Mazzeo et al. 2016a).

The aim of this study was to assess the gender disparity of drugs addiction as doping practice and breakdown by sport bodies and gender.

Methods

The data show of the anti-doping controls carried out by the Ministry of Health from 2007 to 2017 (www.salute.gov.it). The authors have firstly analysed the data of Italy Anti-doping official website of each single report of the above mentioned Ministry, then they have extrapolated and combined the information on the consumption of doping substances in male and female athletes.

Results

In Italy, Ministry of Health every year commissions the anti-doping test. Italian legislation provides for only urine tests on athletes (Strano & Botrè, 2011; Mazzeo et al., 2018). Since 2007 to 2017, 13896 athletes have been checked and 458 were doped corresponding to 3.5% of the total analysed of which approximately 61 women and 358 men. The majority of controls was carried out in men's competitions. The Commission justified this prevalence with 3 reasons: 1) controls were carried out on minor categories and some sports are practiced by women only in the higher categories; 2) some sports are mainly male; 3) often in the calendars of the federations do not appear the place and date of the events and it is therefore difficult to carry out checks (Ministero della Salute, 2008-2018).

As shown in Figure 1, the highest percentage of them is recorded for men in 2010 with 6.3% and for women in 2015 with 1.9%. The highest number of doped men is recorded in 2010 while for women in the years 2007, 2011, 2012 and 2014. But the difference is considerable, in fact we are talking about 50 men against 8 women.

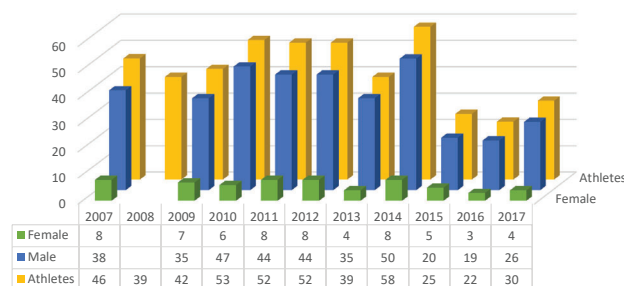


Figure 1. Number of doped athletes from 2007 to 2017 breakdown by gender

As regards the spread of doping in the various sports analysed, results has shown (Table 1) that cycling is the sport most affected and in particular by men. In reality, in 2011 and 2013, 25 and 19 men were listed against only 2 women. Football and rugby also record relatively high numbers. In fact, the men

doped in the aforementioned sports amount to 7 respectively in 2007 and 2012. The number of women doped in various sports, in the various years is insignificant. The highest number is 2 recorded in cycling (2011, 2012, 2013), in track and field (years 2011 and 2016) and in rugby (year 2012) (Table 1).

Table 1. Number of doped athletes from 2007 to 2017 breakdown by sport bodies and gender

Sports Bodies 2007-2017	7		8-10		11		12		13		14		15		16		17	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
AICS	2	0																
ASI	1	0																
ACI – Car racing	0	-																
C.N.S. Libertas	0	1																
CSEN - CrossFit																	3	0
FASI - Climbing	1	0					0	0	0	0			0	0	0	0	0	0
FCI -- Cycling	6	0			25	2	11	2	19	2	0	0	11	1	9	0	11	1
Fcrl - Cricket																		
FGI - gymnastics	1	0					0	0	0	0	0	0	0	1				
FIB - bowls																		
FIBa - Badminton	0	0																
FIBBN Am Body Nat					1	0			1	0	1	1					0	0
FIBIS - Biliards	0	0																
FIBS - Baseball & Softball	0	1			2	0	3	1	0	0	0	0	2	0	0	0		
FIC - Rowing	0	0							1	0	1	0	0	0	0	0	1	0
FICK - Canoe Kajak	0	0			0	0	0	0	0	0	0	0	1	0	0	0	0	1
FICSF canoe seat fixed	0	-													0	0	0	0
FIDAF - Amer.Football							1	0	1	0	0	0						
FIDAL - track and field	1	1			0	2	2	0	0	0	3	1	1	1	2	2	4	1
FIDS - Dance Sport	0	0							0	0	0	0			1	0		
FIG - Golf	1	0					2	0	0	0	1	1						
FIGC - Football	7	1			2	0	5	1	1	0	0	0	0	0	2	0	3	0
FIGH - Handball	4	0			1	1	1	0	3	0	0	0	1	1	0	0	0	0
FIGMMA (Marti. Arts..)							1	1			0	1			0	0		
FIGS - Squash									0	0	0	0			0	0	0	0
FIH - Hockey	1	-			1	0	1	0	0	0					0	0	0	0
FIHP Hockey & Skating	0	-									1	0			0	0		
FIJLKAMJ	2	1					1	0			0	0	1	0	1	0	0	0
FIKB FIKBMS Kick Box	0	-					0	1	2	1	0	0						
FIM - speedboat racing	0	-																
FIN –Swimming	0	0			1	0	1	0	1	0	2	1	0	0	1	0	0	0
FIP - Basketball	0	1					1	0	0	0	0	0	2	0	1	0	1	0
FIPAV - Volleyball	0	1			0	1	0	0	0	0	0	0	0	0	0	0	0	0
FIPE – FIPCF Weights...					2	1	0	0	1	0	0	1					0	0
FIPL - Powerlifting																	0	1
FIPM –Modern Pentathlon															0	0		
FIPSAS – Game fishing	1	0			0	0			0	0	0	0			1	0		
FIR -Rugby	2	-			2	0	7	0	1	0	1	0	2	0	1	0	1	0
FIS -Fencing	0	0			0	0	0	0	0	0	0	0	0	0			1	0
FISB -Bowling	0	-							0	0								
FISE - Equestrian sports	0	0							0	0			0	0				
FISG - Ice Sports	1	0			1	0	1	0	4	0	0	0	0	0	0	0	0	0
FISI - winter Sports	0	0			3	0	1	0	0	1	0	1	0	0				
FISN – Water skiing	0	0																
FIT -Tennis	2	0			1	0	3	2	0	0	0	0	0	0	0	0	0	0
FITA - Taekwondo					0	0	0	0	0	0	0	1	0	0	0	0	0	0
FITARCO -Arkery	0	1			1	1	0	0	0	0	3	0	0	0			1	0
FITAV	0	-									0	0	0	0				
FITeT – Table tennis	0	-			0	0	0	0	0	0								
FITRI -Triathlon	1	0			0	0	2	0	0	0	0	0	0	0	0	0	0	0
FIV - Sailing	1	-							0	0	0	0	0	0				
FIWuK - Wushu Kung Fu	0	-											0	0				

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Sports Bodies 2007-2017	7		8-10		11		12		13		14		15		16		17	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
FMI – Motorcycling	1	-																
FPI -Boxing	0	-							0	0	0	0	0	0			0	0
UISP (Italian Sport for all)	1	0			0	0					0	0						
UITS - shooting gallery	1	0									4	0						
U.A. ACLI					1	0												
WABBA – world amat. BB															0	1		

As concern the consumption of prohibited substances, over the year there is a difference between men and women. First of all, the data show a high consumption of doping substances in men instead of in women. In particular, men take more cannabinoids, stimulants, diuretics and other masking agents,

anabolic agents and hormones. In 2017 there was the highest number of men who took a substance: 27 athletes, in fact, took anabolic steroids. Different speech for women. In fact, for them there are irrelevant data with the exception of 2014 in which 10 women took diuretics (Table 2).

Table 2. Number of doped athletes from 2007 to 2017 breakdown by substance and by gender

Sports Bodies 2007-2017	7		8-10		11		12		13		14		15		16		17	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Cannabinoids	17	5	12	2	20	1	9	1	2	1	5	0	4	0	3	0		
Stimulants	11	1	8	5	9	4	4	0	16	0	5	0	4	0	10	0		
Diuretics and masking agents	5	4	17	3	7	6	6	0	17	10	2	4	2	3	4	1		
Anabolic agents	3	0	14	2	5	1	20	1	23	0	14	0	3	2	27	1		
hormones and related substances	3	0	3	0	7	1	11	0	16	0	3	0	4	0	2	0		
Corticosteroids	2	0	8	2	3	0	5	1	5	3	3	3	7	0	3	2		
beta blockers	1	0							4	0								
beta agonists			4	0	1	0	1	1	2	1	1	0	2	1	2	1		
Narcotics									1	0								
Hormonal and metabolic modulators													0	1	0	1	2	0

Conclusion

The athletes can improve the effectiveness of using unconventional methods to improve sports performance in a Team Sport (Montesano & Mazzeo, 2018). The physical abilities of athletes-distinguished in coordination and conditioning abilities-are always evaluated according to their performance and their success both as individual and as a team (Montesano, Tafari, & Mazzeo, 2013).

Therefore, Doping or taking substances for the purpose of enhancing sports performance has a long history. Drug use has always been associated with men. Lots of researches demonstrate that in the past the consumption of drugs by women experienced more severe social disapproval from men. In the early era of modern sport scholars and practitioners are paying an increasing attention to gender diversity. The injection of drugs by men was even tolerated (Buccelli, Della Casa, Paternoster, Niola, & Pieri, 2016; Bobzean, DeNobrega, & Perrotti, 2014; Mazzeo et al., 2018).

Therefore, there are lots of studies based on the male population, as well as anti-doping tests mainly focus on males. But, over time, a wide use of drugs has also been observed in women. In fact, the 2015 European Drug Report of the European Monitoring Centre for Drugs and Drug Addiction indicated that approximately one in four users entering treatment are women and one out of every five drug-related-deaths is female (Buccelli et al., 2016; Calatayud, Alcaide, Zurian, & Benavent, 2007; Striegel, Ulrich, & Simon, 2010).

However, gender differences in drug intake depend on several factors: genetics, physiology, anatomy, and sociocultural expectations and experiences (Badoud et al., 2011; Mazzeo, 2016; Santamaria, 2016). Moreover, gender also influences the course and treatment of substance use disorder. Gender differences are in personal and psychological characteristics.

Women, unlike men, tend to pass more quickly from occasional consumption to addiction than men, they are looking for increasingly high doses of drugs, especially during periods of abstinence, tend to fall into recidivism, and are less likely to seek treatment (Stella et al., 2003).

At any rate, the effect gratification linked to the intake of drugs associates men and women (Heggie, 2010). Drugs, in fact, give pleasant sensations or help the subject in his activity. Moreover, people (equally men or women) with an ego orientation don't want to improve their self but only give the appearance of improvement (Tavani et al., 2012); they are aware that only with their own abilities can't excel over others. They, also, hate defeat and therefore, look for the victory in any way (Duda, Chi, Newton, Walling, & Catley, 1995; Duda, & Nicholls, 1992).

The International Olympic Committee (IOC) established a Medical Commission (IOC-MC) which had the task of designing a strategy to combat the misuse of drugs in Olympic Sport (Mazzeo et al., 2016). Moreover, in sportsmen and women, the first step to prevent the recourse to the doping is to extend the knowledge on it and in particular on its dangerous effects on health (Altavilla, Mazzeo, D'Elia, & Raiola, 2018; D'Elia, Mazzeo, & Raiola, 2018; Mazzeo & Raiola, 2018). Studies, should be carried out in order to improve our knowledge of the safety profile of drug use in male or female athletes, due to conflicting outcomes between gender differences.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Challenges of Sports Branding

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Abstract

Nowadays, sport has a much more complex and important role than it used to have in the past from many different points of view- it has become not only a way of everyday life which represents a source of positive energy and contributes to healthier life, but also a symbol of the power of the nations themselves and a kind of business industry which has strong implications on different aspects of social development as well. Today's sports organizations realize their business at a highly profitable level and invest huge money in sports marketing and branding. Contemporary sports marketing is oriented towards a proactive relationship with customers of products and services, as well as with other stakeholders in order to achieve their main goal and to make loyal and satisfactory "consumers". Having on mind the fact that brand represents synonym of quality and that it motivates, runs, empowers and create confidence- it is clear why creating a brand identity and image has a great importance for sports organizations, customers, fans, sports clubs, media, as well as for the country itself.

Key words: sport marketing, brand identity, brand image, marketing communications

Introduction

The paper will provide not only theoretical, but also a practical approach to challenging of branding in sports organizations. Having on mind the evident increase of interest for sports events as well as the fact that demographics of people who are keen on sports events have already been significantly changed, it is clear why marketing approach in sports organizations is much more important than ever before. On the other side, it is important to mention the socio-cultural background of most sports which is based on strong emotional feelings which very often leads to high level of loyalty to clubs and teams.

Today's sports organizations realize their business at a highly profitable level and invest huge money in sports marketing and branding. Many sports organizations have sponsors who invest millions of euros in sport events in order to promote their products and services, increase the visibility of the sports brand and increase profits. The date that maybe represents the profitability of sport is the transfer of Neymar from Barcelona to Paris Saint-Germain which costed 222 mi-

llion euros and represents the biggest transient transaction in football history.

Sports industry is a highly profitable business. According to (Mullin, Hardy, & Sutton, 2013), sports marketing aims to meet the needs and desires of sports consumers through all the activities through the exchange process. The main focus of all sports marketing actions are sports viewers. Therefore, the understanding of the demographic and psychological factors that affect sports consumers in the basis and key element of development of the brand strategy. Something that is very specific in sports marketing is the fact that products/services related to one team or club are not attractive to supporters and fans of another team or club and that fact should be the important element of marketing strategy itself.

The basis of sports marketing lies in the uncertainty of the results of the event itself and elements of drama which are usually strongly connected to it, so the increase of uncertainty actually attracts spectators and causes feelings of excitement and passion. One of the key elements of success in sports organizations is actually the process of understanding of the



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audience. But, unlikely in some other fields, in sports this process is quite complicated because of the fact that there are many different target groups that should be addressed by different marketing approaches. One category will be extremely familiar with particular sport and its rules, with players and their strengths and weaknesses, the other will not, one category will attend every match, while the other will be satisfied with TV transmission or only with making familiar with results. All these categories will demand different marketing approach but all of them will try to make its favorite team or club to its own values which is extremely important for making successful strategy.

The aim of this paper is to point out the significance of sports branding for sports organization and clubs, through the prism of modern media and communications.

The sports branding

The brand identity includes a combination of the name, logo, slogan, design, color, brand performance, etc. which aim to achieve stimulation reliability in order to provoke positive feelings and emotions of closeness (Clow & Baack, 2002). The brand name is a kind of primary interface in communication between brands and potential consumers.

In the process of choosing the brand name, it is necessary to take into the account its symbolism and the associative characteristics of culture, as well as the communicative potential of the name itself. Good examples are: Manchester United, Fed Cup, Olimpiakos, Barca, etc. In this context it is interesting to mention Hans Gamper who published the advertisement in the Catalan newspaper *Los Deportes* in which he expressed his desire to establish a football club in Barcelona. Because of the great interest, the first eleven Barca players appeared at the first meeting. It was a Swiss-Catalan-British mix which today represents one of the most challenging Spanish football institutions. But something that is extremely important from the point of view of sports branding is the fact that its great official slogan "More from the Club" from 1899 is kept until today.

Branding represents a unique idea and concept that enables sports organization to enter into the consciousness of sports consumers. A sports brand as a holistic sum of many different elements represents a unique and identifiable symbol of a sports organization which makes it different from its competitors. The value of the sports brand is strongly used in the service of increasing the revenue of the sports organization. The brand leads to customer loyalty or consumer loyalty, and loyalty alone can encourage readiness to pay a higher price for a product or service, from 20 to 25% (Kotler & Keller, 2016). Maybe the perfect example is English Football Club Manche-

ster United, maybe the most popular European football club, which according to estimations of KPMG is worth of 4.125 billion euros and whose brand value significantly exceeds the value of the Football Club Real Madrid and Football Club Barcelona.

The Football Club Manchester United, with its name and mark, associates the target group on good sporting values, achievements and sports fun. Although Football Club Manchester United is not the best club in the world, or in Europe, the fact is that it is one of the most recognizable. For example, it's the most recognizable football club even in China (everyone knows what you mean when you say "ManU"). This Club is third ranked in the world in terms of wealth and revenue. The club has various recordings to its name like the joint record holder of FA Cups, a record number of titles, league cups and FA Community Shields. Branding as the culmination of the complete marketing process is also the ultimate success of the business. Fan loyalty is basically a brand strategy of this club, which generates up to \$ 200 million a year from tickets. The value of his brand makes up 24% of the total value of the club. The advantage of the club is the ability to communicate fans through a website with their favorite club.

The important part of branding process is also a logo itself. The role of the logo as part of an integral communication system of a company or organization is to symbolize its modes of operation and project the unique credibility of the entity it represents. Among sports brands, Nike is in second place by the brand value. With the breakthrough on the Asian market, Nike has found great potential for growth. Nike is the name of the Greek goddess of victory, while the logo of this company symbolizes her flight. Its creator is a student at the Faculty of Design, Carolyn Davidson, who received \$ 35 for the design of this logo, so that Nike's founder, thanks to the huge increase in popularity of this brand and in gratitude, donated 500 shares of Nike company.

The brand's slogan is an associative sentence or term that represents the mission and essence of the brand. A good slogan can play a valuable role in identifying the brand. Frequent repetition of a good slogan with the name of the brand may have hypnotic effects on consumers and lead to unconscious acceptance of the brand and the creation of its desired image (Rakita & Mitrovic, 2007). For example, Nike's advertising campaign from 1988 contained a simple slogan - Just to it. It is somewhat considered that this advertising campaign is the most deserving for the success that the company has achieved in the coming years, leaving its main competitors behind and it represents one of the most successful advertising campaigns in the world in general.



Figure 1. Logo of basketball club Chicago Bulls

When analyzing sports clubs, it is interesting to mention the logo of the Chicago Bulls Sports Basketball Club (Figure 1).

One of the four most recognizable clubs in the world, Football Club Barcelona, a leading proactive brand strategy, modernized its logo in September 2018, which will be officially launched in the 2019-2020 season. The biggest change for the logo will be the removal of the "FCB" lettering currently featured prominently on the club's shield.

The number of brands is increasing year by year, which was highly influenced by market hyper fragmentation, the diversification of the market, the shortening of the life cycle of products, etc. (Kotler & Trias De Bes, 2003). Brands today have strong associative and functional attractiveness. Functional attractiveness is based on technological and innovative superiority, while the associative advantage meets existing human needs in a unique and recognizable way. A high level of asso-

ciative value has the Lakers Sports Basketball Club, as a global brand by which people are delighted (iconic brand).

The three-dimensional commitment of each brand is defined by: the character of the brand - brand personality which is deviated from the profile of the target group of the brand's users, as well as by the brand's purpose which reflects its usefulness and credibility. The comparative advantages of associative brands are often connected with various intangible associations - they are not equally visible to everyone and they are not easily provable. Not only is there a large number of associations on a particular brand, but there are also a very large number of ways to challenge those associations (Rakita & Mitrovic, 2005). A sincere brand is a brand with a strong tradition and a clear set of values reflected on consumers. The relationship that such a brand accomplishes can be identified with a relationship that the respected family member has with



Figure 2. Logo of football club Red Star

his or her fellowmen. The brand of Football Club Red Star belongs to this category of brands (Figure 2).

An exciting brand is the one that associates on youth, which has the spirit of modern times and which is innovative. A typical representative of this group of sports brands is Football Club Manchester United (Figure 3). A competent brand reflects the impact and performance, and logo of Barcelona belongs to this category. Sophistication as a characteristic implies a

certain amount of exclusivity and not every brand can possess it. This brand creates a strong connection with its consumers in a unique way and provokes a high level of loyalty. A strong brand is an individual, one who cares about itself, a bit egocentric, focused on its "athletic attributes" (Aaker, 1996). Such a brand is Nike, which reflects individuality and constant need for proof which differentiate it from many other brands and triggers consumer preferences.



Figure 3. Logo of football club Manchester United

From identity to image of sports brand

The strength of the brand is based on the image of the brand and is located in the consumer's mind. Brand image is an image or perception that consumers create about the brand. The brand's positive image exists only when consumers respond positively to the product. The brand with a positive image is more suitable to be the carrier of the extension and it represents a great basis for a more promising promotion. For example, the arrival of David Beckham in the Football Club Manchester United, brought a million profit from the sale of promotional material with his name, which is also a great example of personal branding in general.

Propaganda marketing is in the function of propaganda communication between production services and concrete consumers (citizens) (Spirtovic, Acimovic, Medjedovic, & Bogdanovic, 2010). The future of marketing belongs to emotional branding which is based on the idea of psychological and emotional connection with the consumer. The brand is treated as an emotional asset. Investing corporate efforts and resources in provoking true emotion of consumers is the best investment a company can make.

The role of media in sports branding is crucial in order to achieve a positive publicity and establish strong, emotional closeness with consumers of sports messages. Communications have made a huge influence on the appearance of the golden age of sport. Online betting, live broadcasts, interviews, advertisements, sponsorships, etc. had greatly influenced that sport became a transnational activity. It is considered that advertisements make the best connection with sports, especially when it comes to announcements of sports events (Olympic Games, Champions League, WC and other World Championships). So, it is clear why, for example, four years sponsorship of the main sponsors of the Olympic Games (Alibaba, Coca-Cola, Visa, Atos, Samsung, etc.) costs about \$ 200 million. In addition to the entertainment role of advertisements, thanks to the possibility of visualization, sport is presented as a form of movement, with emotions, a state of tension and excitement.

There are so many ways to inform public and sports consumers, to inspire and motivate them. Media and communication is the world's fastest growing industry today and is an area of rapid and continuous technological, political, economic, and social change (Vineet, 2012).

It is well known that press, television, radio and social media play an important role in creation of image- they may create heroes, legends and champions, giving sportsmen a mythological significance, stuttering even in their intimacy. Lessons from the Tiie Television Sports Manhood Formula are seen, in varying degrees, in these football, basketball, extreme sports and Sports Center programs and their accompanying commercials. U.S. sports media outlets enjoy great popularity. In the late 1990s, 94% of children surveyed said they consumed sports media, and many said they did so daily (Hardin & Greer, 2002).

In this age of digital advertising and proactive consumers, more and more sports brands are turning to brand videos instead of conversion videos. They all try to tell us great story, trying to drive brand awareness without selling a product too hard, makes a bold statement and convenient, online consumer accessibility.

When talking about sports branding, it is inevitable to mention sponsorships which represents excellent form of pro-

motion in sports marketing. Typical example is Red Bull which has extremely interesting sponsorship strategy for sporting events, especially those closely connected with adventurous ones. This group of events is not chosen by chance-in contrary it is its main target group- people keen on adventure, adrenaline, excitement, adventurous sports etc. In addition to the great slogan "Red Bull gives you wings," the company offers free tours for all its sponsored events, believing that opinion makers and sports consumers have a major impact on the growth of purchases. In classical Red Bull manifestations, such as sports events such as Motorcycle Racing and Red Bull's Day of Flying, event participants are even included in designing a marketing initiative. By sponsoring sport events and including participants in tastings and prize-winning games, the company achieves greater connectivity with potential and actual consumers of the brand, specially focusing on its target groups.

Conclusions

Nowadays, marketing approach and branding of sports activities have more important role than ever before. Sports branding is a strategic process that consists of series of activities carried out in order to create strong brand identity and make its recognizable image on the market.

The main goal is to send a positive message to specific target groups and make loyal, satisfied sports consumers. In that process, the role of media is one of the most crucial in order to achieve positive publicity and make a strong, emotional closeness with consumers of sports messages. By recognizing the importance of this approach, it is evident that a lot of sports organization put a great effort on branding process and invest more and more money in realization of different marketing campaigns, and it is sure that this approach will be even more important in future. From that reason, it is extremely important to put these issues in the center of not only professional, but scientific and research interest as well.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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ORIGINAL SCIENTIFIC PAPER

Assessment of Sport Performance: Theoretical Aspects and Practical Indications

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Abstract

Sport evaluation is a fundamental moment in the training process of every athlete, every team and is an indispensable support for the coach. The aims and all the aspects related to the assessment, will be taken into consideration, together to that can have a positive effect on performance, allowing each athlete, team and coach a good workout or match, whatever their competitive level. The approach is argumentative theoretical for the part relating at the training theory. Firstly, summarizing and deducting the scientific idea of research and of apply it in the practices of measurement and evaluation of the sport performance. One of the topics investigated is the relationship between genetic factors and training factors, in determining the performance of an athlete. The athlete's evaluation process should be useful in setting up and controlling the training and providing information to improve sport performance.

Key words: *measurement, test, evaluation, training, performance*

Introduction

Sport evaluation is a fundamental moment in the training process of every athlete, every team and is an indispensable support for the coach. This aspect be part of in the interest of accademic field of the scientific activity, related to the development of theories, techniques and methods for training and for the practice of different sports and motor activities and evaluations of performances (Raiola, D'elia, & Altavilla, 2018). Sport performance is influenced by a series of factors that are variously connected to each other; these factors contribute in determining the performance in different ways, which can be distinguished in quantitative, qualitative and temporal. Sport training is a training process that aims to achieve the highest possible performance under two aspects: quantitative and qualitative (Altavilla & Raiola, 2018). To analyze the factors that determine sport performance, different approaches can be used, with the aim of obtaining all that information to evaluate one or more variables, representative of one or more aspects (qualitative and quantitative) that are, in some way, related at the sport performance (Nughes, Rago, & Raiola, 2017). There is a difference between measuring and evaluating even though

these two processes are connected to each other (Safrit, 1990). The term measure indicates the process by which a variable is assigned to a given numeric value; therefore, measuring is merely quantitative, objective and reproducible. Once detected the different variables (measured quantities), through appropriate conversion calculations, it is possible to obtain all the other quantities that are defined derived quantities (Nelson, 1995). This procedure takes the name of analysis, ie mathematical operations that allow to present the data collected in different form (Winter, 1979). With the term to evaluate, however, we mean the procedure that allows to interpret and judge the measured quantity (variable detected). Often, however, the assessment is based on subjective personal experience, on specific knowledge of sports activity and can also be influenced by feelings, opinions and prejudices (Lariviere, Godbout, & Lamontagne, 1991). The evaluation can be defined as a process applied systematically to identify the dimension of the contribution of the various factors related to sport performance. The aim of the athlete's assessment is to set and to control the training or to provide useful information to improve sport performance. All the measurement and evaluation process



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must be supported by scientific research, which aims to establish or verify the knowledge, laws, hypotheses and theories concerning the different aspects of knowledge. Furthermore, scientific research is characterized by rigor, advertising and controllability and uses an experimental design, which also presupposes statistical analysis (Jelaska, Delas Kalinski, & Crnijk, 2017). In this paper, the aims and all the aspects related to the assessment, will be taken into consideration, together to that can have a positive effect on performance, allowing each athlete, team and coach a good workout or match, whatever their competitive level.

Methods

The approach is argumentative theoretical for the part relating at the training theory. Firstly, summarizing and deducting the scientific idea of research and of apply it in the practices of measurement and evaluation of the sport performance.

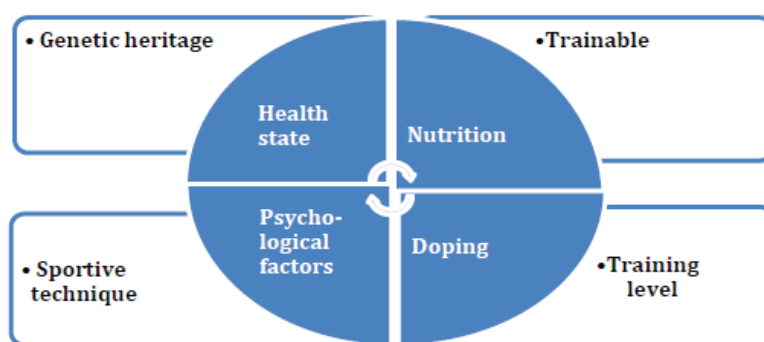


Figure 1. Factors of the sport performance

Another important factor is the ability to support high training loads, which can also be inherited; positively influencing performance, limiting the possibility of incurring injuries and overtraining syndrome. This characteristic, the positive reaction to training, is called trainable, and can be defined as the ability to improve one's motor potential in response to a series of training stimuli (Issurin & Lustig, 2005). The latter is inevitably linked to the sportive technique, which can be defined as the set of all those elements that allow you to adapt the athlete's motor behavior to the contextual situation, between which, also, the error correction made by the coach with verbal rules (Raiola, 2013), in order to obtain the best possible performance (Lees, 2002). Today is consolidated the importance of physical activity to health (Altavilla, D'Elia, & Raiola, 2018a), but also the state of health of the athlete is important and must be investigated through a dual assessment, functional and sportive fitness; while the functional one may depend on the performance, the sportive fitness has the preventive purpose of excluding contraindications to competitive sportive practice, or to establish in the sedentary subjects the exercises devoid of risks (King & Senn, 1996). Related to the state of health there is certainly also nutrition, which must provide, first of all, the energy substances necessary to support the training and the increased food needs of the athlete. Physicality and well-being, contributing to the psychic development (Valentini, Bernardini, Beretta, & Raiola, 2018). Psychological factors are often essential for sportive results (Raglin, 2001). Victory and defeat often depend on the athlete's personality and in some ways on the difficult balance of emotions caused by the psychological relationships established between athletes (own team and opponents), with coaches, referees, managers, journalists, public, family and friends. Finally, even doping can contribute to

Performance factors

Sport performance is the result of several factors, some of which are closely related to the athlete, hereditary and acquired (Figure 1); while others act in an integrated way on the athlete and on the team, influencing the training and competition process. One of the topics of interest in sporting activities is the relationship between genetic factors (the talent is partly genetically determined) and training factors, in determining the performance of an athlete (Bouchard, Malina, & Perusse, 1997). According to Sergjienko (2001), the sons of the great athletes have a 50% chance of inheriting notable sportive abilities. A probability that rises up to 75% in the case of children of a couple of great athletes. The genetic patrimony has a fundamental role in the performance, not only the anthropometric, physiological and psychological characteristics can be partly inherited, but also the improvement capacity induced by training (Bouchard, 1986).

altering the performance in an illegal manner; in fact, there are athletes that try to improve in artificial way their performances, legal or illegal, healthy or harmful to health (Mazzeo, Altavilla, D'Elia, & Raiola, 2018). Therefore, its role in determining certain performances can not be ignored or underestimated, especially for the impact on athletes' health and on the education of young people. Doping concerns the whole society, it involves not only elite athletes but amateurs too, their friends and relatives (Mazzeo & Raiola, 2018).

Results

The assessment of sport performance can be achieved on the basis of a scale of reference values; this is done considering both the type of measure (test) and the descriptive statistics applied to it; or express the data collected as a percentage of the values obtained from the reference values. The initial assessment serves to identify the characteristics of an athlete or group of athletes, or to define or complete the anthropometric and physical-motor profile of each of them. In this case the tests are used to perform a sort of photograph of the athlete's status and will then help to define the objectives necessary to set up the training program (entry test).

The assessment procedures can be proposed several times during a sportive season, in order to evaluate the effects of training and therefore the achievement of the planned objectives in the short, medium and long term (control and outgoing tests). A further opportunity to evaluate the effects of training is the search of relationships with the performance (Figure 2). It is not correct to think that the performance can only be investigated through one or more tests; in fact, we must not forget that the best test is the match. Sometimes the tests are administered with the purpose of motivating an athlete and in

particular cases, also to satisfy a specific desire of the athlete, whose psychological meaning must be understood and whose importance must never be underestimated. Among the different procedures that can be used there is also the assessment

made during the match, in this case the coach collects empirical data visually and then analyzes them only on basis of his experience, to quickly provide feedback to the athletes who will use them in the same match.

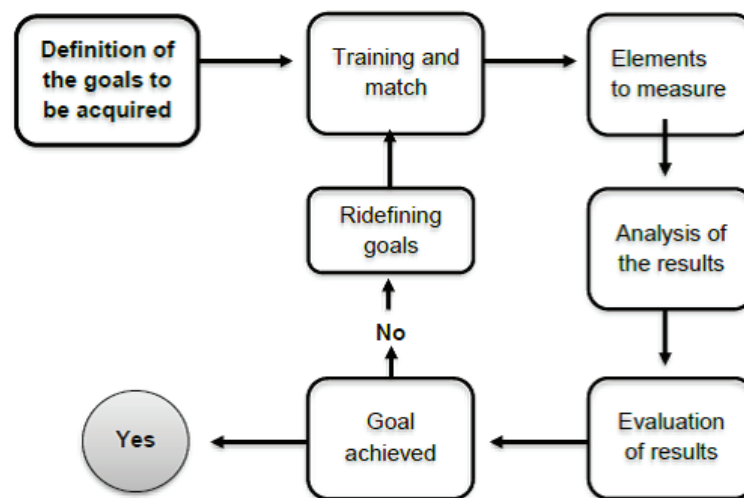


Figure 2. Analysis, measurement and evaluation process

Discussion

In the last years there has been a massive entrance of pervasive computing among sport-related technologies (D'Isanto, Altavilla, & Raiola, 2017); the use of these modern technologies (Gps, slow motion, tracker, accelerometers, bio-sensors) allows to provide real-time experimental data from which to obtain the information useful for improving the sport performance (Altavilla, Mazzeo, D'Elia, & Raiola, 2018b). It is possible to distinguish the tests in general and specific (Dal Monte, 1983). The tests that investigate the physical qualities such as strength, power, endurance, flexibility, etc., are defined general and have the purpose of verifying the acquisition of the minimum necessary levels to proceed in training and for injuries prevention. When a physical quality is insufficient, the appearance of overload or injury pathologies can be observed and the improvement of other physical qualities or sportive technique is often negatively influenced. The specific tests, however, have a high technical value and can be studied from time to time according to the specific needs (specific) of each individual athlete. According to some authors (MacDougall, Wenger, & Green, 1991) this distinction concerns essentially the place where the tests are carried out: in a laboratory, in the gym or on the training field. Today we can consider this distinction obsolete, since many laboratory tests can be carried out in the field and some so-called field tests can be performed in the laboratory. Field tests have the characteristic of not requiring complex and expensive equipment, and therefore of being simple and quick to perform, easily interpretable and economical; some examples: the Cooper test, the Shuttle test or Leger, Jump and reach test, Speed test (35 meters), ecc. These tests are available to everyone, can be proposed at any time and are a very valuable aid in training planning. Regardless of the type, each test must possess three basic requirements (validity, reliability and objectivity) that guarantee the goodness of the information that is collected.

Coaches and anyone involved in training of young athlete and of the teams must have a deep theoretical knowledge of the

factors of the sport performance, of the operational tools and the procedures of detection and evaluation, in order to be able to direct all the physical and technical programming, the methodological choices and procedural attentions, while respecting the characteristics of the athletes and of the sport teams. The evaluation of sport performance is a fundamental moment in the training process of every athlete and every team and is an indispensable tool for every coach or sportive operator. The knowledge of the main theoretical aspects, which we have dealt in this study, is necessary to avoid incurring conceptual errors and interpretation. It is important that every sportive technical includes in the training planning moments dedicated to the assessment, which allow him to verify the achievement of the objectives set and also the goodness of his work.

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REVIEW PAPER

Features and Trends of Social Sciences Applied to Sport in the Italian Context

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Abstract

In Italy, initially the social sciences of Sport was considered a specialization to the macro-discipline of Sociology of leisure time, but today it boasts a tradition of plurivertennial studies. It is equally important to consider the number of this discipline among the studies on mass culture due to its extent of aggregating phenomenon. The purpose of this article is to examine the research trends of social sciences applied to sport in the Italian context. From a methodological point of view, a systematic review of the existing literature will be provided following the PRISMA guidelines both on the main research currents and on the main emerging topics in the contemporary specialist literature. Comparing application studies and empirical experiences, it can be suggested that the social sciences in Italy with an international scientific tradition play a key role in research applied to sports by specializing research tendencies towards specific topics of study.

Key words: *sport, sport science, psychology of sport, sociology of sport, physical education*

Introduction

Sociological research in this field has had a substantial quantitative development, made possible by the transition of theories, models and constructs of the social sciences to this unprecedented field of knowledge (Porro, 2001). The main approaches that sport sociologists have followed in contemporary research trends have been: structural-functionalist theory, conflict theory, symbolic interactionism and historical sociology.

Functionalism considers society as an organic system characterized by the function of the production process, in which inputs enter this process to generate outputs released into the environment, sometimes through a circular logic. The survival of this system is linked to the satisfaction of four fundamental functions: the function of preservation of the latent model (1), that is the maintenance of one's own identity over time and with respect to the surrounding environment; the function of integration (2) between the parties, regulated by a system of rules that direct the internal flow; the function of achieving the goal (3) that the system must pursue and, finally, the adap-

tation function (4), ie how the system responds and organizes the stimuli coming from the environment. Each social system is organized into subsystems that perform these four functions, for example, the family or school perform the function of preservation of the latent model. This theory was simplified in Merton's structural-functionalism model (1968); with respect to the rigidity of the subsystems the distinction was introduced in the systems between latent and manifest functions and between functions and dysfunctions, thus creating the possibility of conflicts within the systems themselves. For structural-functionalism, society is governed both by shared values and by institutions that maintain social order.

According to the (functionalist) theory of conflict, social relations are built from conflicts, in fact, the parties involved are involved in an intense interaction in which each is influenced by the actions of the other. Conflict strengthens identity between conflicting groups and creates strong bonds of intra-group solidarity. In order to neutralize internal conflicts within groups it can be effective not to destroy an external adversary whose presence strengthens internal bonds. The presence of conflicts allows to create rules of action that limit



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intrinsic destructiveness and produces the search for group alliances. In a less optimistic perspective (Kriesberg, 1982) the conflict is characterized by processes of escalation and de-escalation that lead, respectively, to the elimination of the contenders or to the resolution through compromises.

Symbolic interactionism identifies social interactions built by individuals as symbolic and meaning guides in human actions. Therefore, reality is not a passive environment of adaptation, but the product of a continuous social construction. Within the socially constructed vital worlds, interactionists identify in the construct of identity the interpretative unity of all the attributions of meaning of the society in which it is positioned. Gender, political, ethnic or religious identities are continually constructed and reconstructed in relation to situations or other collective identities.

Elias (1987), one of the leading historians of historical sociology, asserts that long-term historical processes can explain the evolution of contemporary societies; individuals are interconnected through social apparatus (figurations) that create mutual dependencies and groups. The study of society, in this perspective, passes through the comparative study of social figures and their historical evolution. Figurations recognize the social value of emotions and the need to rationalize and control them within a process of civilization. At the macro-social level the process of civilization is the plurisecular effort of societies to channel conflicts and violence

Methods

A systematic review of the existing literature was adopted to search for articles in the main international databases (Google Scholar, PsycInfo and Scopus) on the issue in the research of social sciences applied to sport in the Italian context, using, in English and in Italian, just the terms “Sport”, “Sport Scien-

ce”, “Psychology of sport”, “Sociology of sport” and “Physical education” as keywords. Following the Prisma guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009) a systematic literature review process has been conducted: the literature search is followed by an evaluation of the titles and abstracts based on the research idea that the social sciences in Italy with an international scientific tradition play a key role in research applied to sports by specializing research tendencies towards specific topics of study (identification) (Toto & Strazzeri, 2018). Bibliographic research and evaluation for the inclusion of publications was conducted independently by the two authors. The disagreements have been solved through a critical discussion, coming to full agreement between them. Regarding the inclusion and exclusion criteria, articles were selected in peer reviewed journals, books or book chapters in English or Italian that aimed to describe or evaluate the dimensions and variables expressed in the above-mentioned research idea (screening). All publications that dealt with addiction only in general, and those publications whose complete format (Relevance) could not be found were excluded. The time limit for the year of publication has been set for the last 10 years, so the articles have been selected since 2008. For the inclusion of the contributions, a qualitative summary of the most relevant information was also conducted with comparisons between the various publications without carrying out a quantitative analysis in the meta-analysis format. The process of inclusion of studies in the systematic review is described in Figure 1. After the elimination of duplicates, the research identified 1002 studies consistent with the research idea. Subsequently on the basis of the title and the abstracts, 547 studies were excluded because they were not relevant. Of the 455 with full text 81 studies met the inclusion criteria.

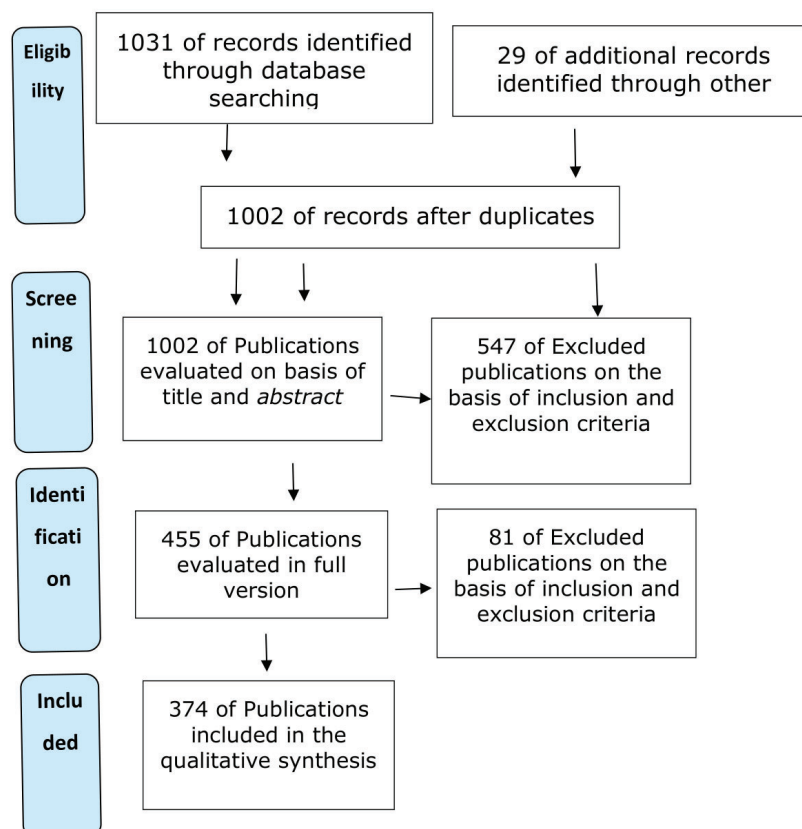


Figure 1. PRISMA Flow Chart of the selection process

Results

This section presents the main contents of the literature

on the topic. From this analysis emerge four main research strands (Table 1):

Table 1. Themes and number of publications

First theme of social science in sport	Second Theme	Third Theme	Fourth Theme
Sportivisation process	Identity construction	Discrimination of gender or race	Political or religious ideology
Publication n. 108	p. n.90	p. n.115	p. n.61

Regarding the first theme, the process of sportivisation (1), a reflection of globalization, has profoundly changed the classic models of sport. The sporting process developed by the rationalization of popular pastimes leads to the transformation of sports activities in the modern sense. Contemporary competition has taken the forms of cosmopolitanism and rationalism so as to become an expression of struggle for the hegemony of subaltern cultures.

An important theme from a sociological point of view is the analysis of the identity structures (2) of sportsmen in contemporary society; the process of socialization through exchange with significant others creates personal identities (Toto, 2017a; Toto, Ruberto, & Toto, 2018). The emergence of collective identities that are formed from social interactions that generate symbols and norms and from relationships aimed at achieving common objectives (Martelli & Porro, 2013) is much more complex.

Even if the athletes are equal (3) the number of men in sports of excellence in all other fields of sport appears much lower, and this also occurs in Western countries (Dati Censis 2006, SIP Survey 2014). Gender and racial discrimination are extensively investigated in social science studies applied to sports. Political ideology (4) has had a close relationship with sport; politics in the history of the last century has manipulated sporting events to legitimize its being. The visibility of ideology is also the means by which political extremists use major sporting events for demonstration actions. From recent studies, it seems that both these two dimensions appear more attenuated in the third millennium, demonstrating a progressive autonomy of sport. Finally, the last area of major importance in social life is the intersection of sport with religion.

Discussion

Compared to the theories reported, the sociology of sport has applied generalist constructs to sports practice. Sport as an institution is a modern education evolved from complex cultural and social processes such as industrialization, urbanization, political revolutions, the importance of the market and the emergence of capitalism. Modernization has accelerated the process of developing social and cultural structures by producing profound changes. Since the 60s of the last century, the global and mass media spread of sports has led to the emergence of new cultural partners in the world sports scene, establishing a shift in the sports center towards non-western countries. The tension to de-territorialisation will be an advantage in social terms, because it will produce an increase in creativity and expressiveness of sporting practice (Maguire, 2011).

Post-modern society, more than in the past, appears to be characterized by forms of control and encroachment of emotions, due to the limits and coercions of the high forms of rationalization of social action (Toto, 2017b). One of the few areas that escapes the control of rationalizing action is sport,

or more generally the activities of free time, in which individuals can give free expression to emotions (cathartic action) and consequently succeed in balancing the coercive forces of the context post-modern social (compensatory action) (Dunning, 1990).

The sociologists starting from Elias (Elias, Dunning, Chicheportiche, Duvigneau, & Chartier, 1998) saw in sport the instrument of channelling aggression following the acceptance by the populations of the monopoly of force by the States. And it is precisely within these dynamics of post-modern society that sport emerges as an institution. Even in sports, gender discrimination plays a significant role. The ideal model of a woman in modern society follows the canons of the “model” icon, far from the athletes’ musculature and the typical values of sports. Through the lens of this prejudice we can read the interest of women in sports activities in terms of physicality statuary, never well-being or competitive competitiveness. The masculine sports ideology considers sport as competition, aggressiveness and supremacy over the adversary, in contrast to the female self-exclusion model from sporting activities (Strazzeri, 2016).

Another field of identity tension is the interaction between ethnic minorities; racism, an unresolved dynamic even in contemporary society, has exacerbated the conflicts produced by new forms of poverty and the economic crisis of the third millennium (Strazzeri & Toto, 2017). Connected to the concept of race, racism indicates presumed superiority with respect to the characters transmitted through biological inheritance, which would determine human behavior. If in a post-modern society one race is superior to another, then even in sports, certain races would excel. Several studies show that it is not race that establishes success in sports, but the socio-cultural context of belonging that directs certain classes of individuals towards the practice of some sports, rather than others or to other types of activities (Groeneveld, Houlihan, & Ohl, 2011). In this perspective the future research prospects direct the studies towards the functions of ethnic integration and social pacification that the sports take on, in fact, there are several examples of occasions for encounter between minors belonging to opposing ethnic groups, as a means of reconciliation as the case of the neighboring ex-Yugoslavia in the 1990s (Cavalli, 2016).

The advent of secularization in Europe has relegated the profession of religion to the private sphere and this appears to be in sharp contrast with the sport characterized, instead, by the values of the body and the public dimension of performance. In the first half of the twentieth century, Europe struggling with the struggles for totalitarianism and the clash between religion and atheism had charged the sport with meanings replacing religion to mobilize the masses (Martelli, 1999). In the contemporary context characterized by globalization, risk, change towards post-modernity, this opposition loses its meaning. The meeting, today, between sport and religion takes on

many facets; this meeting is encouraged for athletes who can draw motivational motivation and resources to conduct correct behavior, both as an element aggregated in youth policies (Toto, 2018a).

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SHORT REPORT

Swot Analyse of Football School “2 Korriku”

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Abstract

The purpose of this work is the information about the hierarchical (structural) organizing of football school “2 Korriku”, and doing it more clearly and effective we used SWOT analyze which presents in details the current situation, positive performances (achievements) the negative ones, possibilities and risks that is the characteristic of this analyze. In the context of this problem not only the analyze of SWOT clarifies everything about the activities, the school itself, but also the purpose of it, adequate insurance of every subtlety in details of the school, staff, volunteers activity, time, date, place and participants where this football school “2 Korriku” activity is taking place. Football school’s coaches “2 Korriku” that are doing their professional and educative job in the advancement of this school, we have used this analyze, where we notified the staff and the coaches in advance about this analyze, who then they gave their opinions in the charts which we present in our work. From these recommendations that we presen below, this school is in a good way of organizing, establishing financial stability, infrastructural and the professional one, based to some other investments that are done, and in the future they are planning to do more, so to accomplish all of these, it’s good to manage them in time by rational use from the management to the coacher of age groups. So the activity of other football schools should be based on football school “2 Korriku” as a model, because to those who are interested, and to the other coaches would be useful based on the results that this educational and sport institution has, where these results will be evident later, whether they are in education, courtesy, donations-sponsorship, infrastructure and afterwards in formation of players.

Key words: SWOT analyze, football school, organizing, infrastructure

Introduction

The Football Club “2 Korriku” was founded in 1957 named after Football Club Proleter. As a great success and important event for the club is considered the foundation of the football school in 1992, which gathered around itself a large number of children who, despite the difficult conditions showed their talent and steadfast determination. It was exactly these children, who became the basis of the first team of 2 Korriku, thus starting the stage of success for this club. In the 1996/1997 championship, Football Club “2 Korriku” was the winner of the Kosovo Cup in football. Despite the challenges and problems that it faced, even after the last war in Kosovo, “2 Korriku” survived and became a determining factor for the quality of football in Kosovo.

High achievements can be achieved in the sport only if the

systematic process of training is applied and young people are involved, and if they are to be oriented towards certain sports branches. Especially for football this should be done as early as from the early ages, but this can not be done if there isn’t a football school that would advance and educate the student. Therefore, the “2 Korriku” football school wants to transfer real values to children such as: getting work habits, respect, joining, tolerance, character strengthening, winning the winning mindset and team spirit. This football school needs to enter a process where the process is most often performed using a tool called SWOT analysis and a shortened example of such an analysis for strategic decision making (Skoric & Bartoluci, 2011).

The SWOT analysis is about four pillars, which are the strong side, the weaknesses, the opportunities and the risks



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associated with the sports organization in this case where many authors have talked about in their work they have analyzed (Bartoluci, 1997; Dumancic & Siric, 2013; Dugalic, 2005; Novak, 2006).

The purpose of the paper is the situation about the hierarchical and structural organization of the club in relation to the school of "FC 2 Korriku". SWOT analysis closely reveals the positive, negative outcomes of the sports organization, the opportunities and risks that can be threatened from outside

the organization of the sports organization, in this case of the football school.

Within this problem, not only does the SWOT analysis clarify everything about the school's activities, but at the same time its purpose is to provide sufficient information about any subtlety within the school. This is preceded by a detailed knowledge of the activities of the school, staff, volunteers of the time, date, place and participants where this activity of the football school "2 Korriku" takes place (Figure 1).



Figure 1. Logo of club

The purpose of the management school and staff's "2 Korriku" football school is to educate children to build their personality through work, entertainment and accompaniment at the same time, then making the player in the future where in a delicate atmosphere the kids will feel comfortable and confident so that they can show all their potentials. Then, through professional pedagogy and educational work, the basic needs of children for the game and movement can be met, in the encouragement and proper development of all pupils in the school as well as in the psychic motor development and in the teaching of the basic elements of the soccer technique in fair way

Swot analysis characteristics

SWOT analysis is an internal and external environmental analysis of sports organizations. The analysis of the strengths and weaknesses of the sports organization allows to see the internal resources valid for its sporting activity plan, while the analysis of opportunities and risks provides complete and critical information for the assessment of situations (Lalazi, 2011). A comprehensive environmental analysis and internal characteristics of a sports organization (strong and weak) is called SWOT analysis (modern sport, 2014). SWOT analysis is a powerful technique to understand the advantages and weaknesses, to look at the opportunities and threats you will face with, also SWOT helps: detect priorities, reveal opportunities, understand weaknesses, manage and eliminate threats (Krasniqi, 2014). This analysis is a detailed examination that helps to look at the internal aspects of the sports organization, sporting activities, and external variants that can affect a full success in all directions.

The SWOT analysis comes from the English language which consists of 4 letters which means: S-strength, strength points; W-Weaknesses, weak points; O-Opportunities, opportunities, T-threats, risks. Therefore, it is necessary for the management of any sports organization to clearly understand the strength (advantages) and weaknesses of your organization.

School organization of football school "2 Korriku"

The football school "2 Korriku" from Prishtina has its own organization which has its own functioning, development, strategy, sections and management which is composed of a group of people with their own ideas and tasks to develop further to this sports organization for a longer period of time. Like every school, this school, "2 Korriku" from Prishtina is structured according to this hierarchy: 1) Assembly; 2) Leading Board; 3) The Supervisory Council; 4) President; 5) Vice Presidents; 6) Director; 7) Secretary; 8) Leaders of the football school

Infrastructure of football school "2 korriku"

Successful sports organizations football school "2 korriku" must also have their own functionality in terms of the exercise function, games, technical-vocational staff, job development, staffing, marketing, profit and investment that are of particular importance to its infrastructure. As far as the infrastructure of this sports organization is concerned, it has the main field (playing field) which is used only for the development of friendly games and championships for all age groups and covered area (balloon hall) which field mainly serves for exercise and is mainly used from the football school during the time of atmospheric rainfall, while after school activities other times are free and it is used by recreational-sports teams which pay for these activities (Thaqi, Fazlija, & Tahiraj, 2011)

Swot analysis of football school "2 korriku"

Prior to this, the trainers (professional staff) have been informed about what the SWOT is. Analysis with all the details and in the Table 1 have been presented by the school trainers about the condition of the club through the SWOT analysis. The "2 Korriku" school football coaches have given their professional and educational contribution to the advancement of this school, so we have asked the school staff through SWOT analysis about the situation of the school, the positive side, its shortcomings, what and how are the opportunities in its furt-

her advancement, the risk of competition.

In this analysis, we see a realistic overview of school members from professional resources to members and other vo-

lunteers so that this school is upgraded in all aspects of infrastructure, staffing, professionalism, financial and outcome, for which every sports organization, club or sports school aims.

Tabela 1. SWOT analysis presented by school staff "2 Korriku" Prishtina

Strength (inside)	Weaknesses (inside)
Motivation and hospitality	Fundraising problems
Volunteering and volunteering of parents	Marketing
Equipment and sports equipment	Lack of transfers
School Success	Not good planning
Work with young age groups	Lack of transfer benefit
Sport-historical activities (anniversaries)	Financial plan - budget
The student in considerable numbers	Sports infrastructure not at a satisfactory level
School work at the right level	Lack of donor-sponsors
Good geographical position (nearby park)	Organization of transport
School organization and professional staff	Lack of psychologist and sports physician
Balloon hall	Accompanying facilities (fitness, pool, offices for
Memorandum of cooperation between several local clubs and abroad	Doctor and staff etc.)
Risk and security management	
Education of children	
Participation with new generations on international tours and their international outcomes	
The emergence of many talents in the country and abroad	
Opportunities (outside)	Threats (outside)
Co-operation with other clubs with bigger names	Violence in sports and out of it (may be)
More stable sponsor and future partner	Socio-economic crisis or decline in living standards
Adult activities	Lack of financial means
Paying attention to businessmen or companies	Obstacle of the municipal administration for granting a longer term permit for use of the field
Investments in infrastructure - regulation of the stadium	Negative behaviors in teenagers
Develop a 10-15 year strategy	Atmospheric conditions (bad weather, unusual weather)
Increase the quality of workout	
Activities abroad	
Services (some clothing and gifts with club logo)	
Presentation of talents in the international arena	

Discussion

This paper is presented through the SWOT analysis as the organization of the "2 Korriku" football school as a model football school for other schools in the country which has a very good organization and which holds the epithet as the best organized school for its results in the country which structure is in development. Considering some parameters like; the structure (hierarchy), the order and the obligations of club leaders, then the club itself will have to make some progress at home and abroad as well (Tahiraj, Miftari, Damo, & Shatri, 2014).

Efficiency, success and continuity of this school primarily depend on its leadership (management), but success will be achieved if from the board to the trainers they need to be good acquainted with their profession as; versatile and creative professions and pedagogues in the care of the realization of professional content. Therefore, in order to realize all these tasks and to function better and more successfully, should first of all take care to ensure the things mentioned above so that for younger or certain age groups it is still to be done their timely management and rational use of training time by the football school, the hierarchy to the age group coach. So, the work of

other football schools should be based on the football school "2 Korriku" because it will serve you how to organize it if you want the results and they will be seen later, whether in donations, sponsorships, infrastructure and the sale of players later or after the age of maturity.

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Conflict of Interest

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SHORT REPORT

Paper Selection Leads to a Misleading Conclusion: Updated Evidence of Ice Slurry Ingestion on Endurance Performance

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Abstract

This short report added to the scientific debate regarding a controversial conclusion published in European Journal of Sport Science. Reasons for the conflicting views have been presented in detail. Importantly, updated evidence suggests that ingestion of ice slurry is an effective countermeasure for endurance performance in the heat. Endurance athletes competing in the upcoming Tokyo 2020 Summer Olympics are encouraged to continue utilizing this simple yet very effective method for best possible performance.

Key words: cooling, thermoregulation, time to exhaustion

Introduction

In a paper published in European Journal of Sport Science in 2018, Choo, Nosaka, Peiffer, Ihsan, and Abbiss (2018) concluded that ice slurry ingestion had no clear effect (Hedges' g , 0.2; 95% confidence interval, -0.07 to 0.46) on endurance performance. I am not convinced of the validity of their literature selection and have great concern about what has been conveyed to those readers relying on science to guide their practice in the field.

Methods

First, the authors' conclusion was biased by one particular study (Byrne, Owen, Cosnefroy, & Lee, 2011) which was incorrectly included in the meta-analysis. The methods of that paper were described in detail in the original article, "Cold fluid was prepared by mixing refrigerated fluid (approximately 4°C) with ice cubes in a vacuum flask to bring the temperature to 2°C ". Mixing water with ice cubes is a common practice in sport science and in the field to reach cold fluid temperature. This however does not equate to ice slurry ingestion and the original article clearly stated that, "The cold fluid in the insulated cup contained no ice". The internal cooling effect is

different between cold fluid and ice slurry due to the enthalpy of the melting of ice. Choo and colleagues (2018) improperly included this study in their meta-analysis despite their purpose was to investigate the performance effect of ice slurry ingestion.

Second, I challenge Choo and colleagues' (2018) selection in their meta-analysis of another three studies (Gerrett, Jackson, Yates, & Thomas, 2017; James, Richardson, Watt, Gibson, & Maxwell, 2015; Zimmermann & Landers, 2015) as valid measures of endurance performance. When it comes to the measurement of elite endurance performance, a time trial offers direct assessment and time to exhaustion as well provides reliable prediction of endurance capacity (Amann, Hopkins, & Marcora, 2008). Gerrett et al. (2017) measured effect of ice slurry ingestion on self-paced intermittent exercise, the test of which was originally designed for soccer-specific intermittent movements primarily taxing the anaerobic capacity. This study clearly did not assess the specific construct of endurance capacity for the purpose of their meta-analysis. The study by James et al. (2015) used a lactate based incremental treadmill running test to predict endurance performance. Whereas the physiological differences, lactate in particular,



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between running and cycling are beyond the scope of this letter, sensitivity and reliability issues are of important consideration in high performance measurements. One important question needs to be answered to consider its validity: Has the original cycling-based lactate test been cross validated in the running mode? Again, repeated sprint ability is more related to short sprint ability than endurance ability and power-based repeated sprint test provides poor prediction of time trial (Balmer, Davison, & Bird, 2000). Thus, the test results from Zimmermann and Landers (2015) does not relate to the purpose of their meta-analysis. Notably, the aforementioned four studies all reported nonsignificant performance effects (Choo et al., 2018). Taken together, four out of eleven meta-analyzed studies were poor selection of the relevant literature, which

biased the main results. Therefore, the stated hypothesis could not be, and was not, answered with the papers selected for their review.

Results

To address the conclusion from Choo and colleagues' (2018) work, an updated meta-analysis has been performed excluding the four studies in question (Zhang, 2019) and reported a significant effect size of ice slurry ingestion: Hedges' g , 0.60; 95% confidence interval, 0.34-0.87. When this effect size is translated to performance effect, it represents 8.73% faster performance in the heat (Figure 1). Guy and colleagues (2015) have reported that elite endurance performance is affected in the heat (Figure 1).

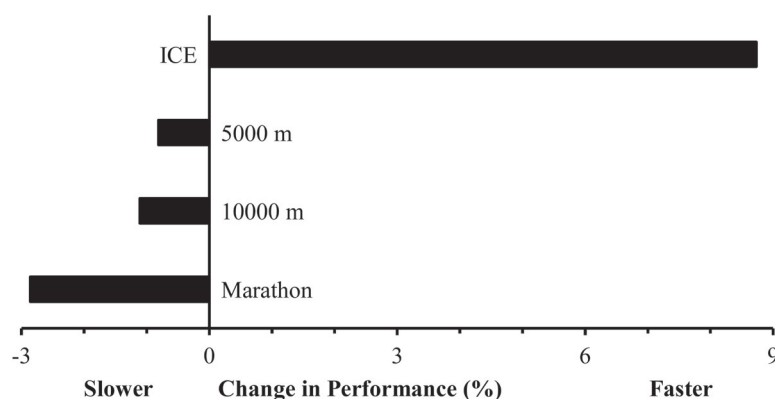


Figure 1. Change in endurance performance in the heat. Ice slurry ingestion resulted in 8.73% (weighted mean, by a random-effects meta-analysis) performance enhancement. Data are replicated from Zhang (2019). For comparison, elite distance performance in the heat was slower (unweighted mean) in hot environments. Data are replicated from Guy, Deakin, Edwards, Miller, and Pyne (2015).

Thus, ice slurry ingestion could effectively neutralize the negative effect of environment temperature on endurance performance and this is supported by the field adoption among elite track and field athletes (Periard et al., 2017).

Discussion

In less than two years, the Summer Olympics and Paralympics will be held in a very hot and humid Asian summer weather, which poses a real challenge to athletes' health and performance. The message from this letter to the practitioners is that, ingestion of ice slurry is effective in enhancing endurance performance and should be recommended for endurance events in the heat.

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SHORT REPORT

Montenegro as High-Quality Sports Tourism Destination- Trends and Perspectives

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Abstract

The contemporary development of tourism is characterized by the development of specific forms of tourism, among which is sports tourism. Tourism and sport are two forms of interconnected activities in the sphere of tourist recreation and their relationship dates back to the very beginning of their development. Sport in modern tourism has not only a perceptive role, but it is also an important content of the stay in which tourists become active participants of various sports: water sports, tennis, golf, skiing, riding, sports games, etc. Having on mind the potential of Montenegro for tourism development, the fact that it represents one of the main pillars of economic progress of the country, as well as the trends and perspectives on global tourist market, it is necessary to identify key advantages and disadvantages of sports tourism in Montenegro in order to improve the quality of this segment of tourist offer.

Key words: *tourism, sport, sports tourism, potential, Montenegro*

Introduction

According to the trends and perspectives on international tourist market, sports tourism represents one of the main pillars of future tourism development. Montenegro as a country has a great potentials for development of this kind of tourism, especially having on mind the natural resources such as sea, sand beaches, mountains, national parks etc. But, although natural resources are important, it is evident that there is a lot of work that should be done in future in order to develop this kind of tourism and adequately valorize and promote it on the global market.

The aim of this paper is to identify the main advantages and disadvantages of Montenegro as sports tourism destination in order to improve the diversity and quality of tourist offer and the level of satisfaction of tourists as well as to position Montenegro as high quality sports destination.

Sports tourism – trends and perspectives

The contemporary development of tourism is characterized by the development of specific forms of tourism, among which is sports tourism. Tourism and sport are two forms of

interconnected activities in the sphere of tourist recreation whose relationship dates back to the very beginning of their development. Sport in modern tourism has not only a perceptive role, but it is also an important content of stay where tourists become active participants of various sports: water sports, tennis, golf, skiing, riding, sports games, etc. The foundation of sports tourism was laid by Glyptis who stated that although academics and practitioners consider sport and tourism two separate activities these two phenomena are actually completely integrated (Glyptis, 2011). Sport tourism is defined as: a journey that encourages an individual to temporarily leave his / her daily place in order to participate actively in sport activities sport related events or be their spectator (Valek Slak, Jurak, & Bednarik, 2014). Bartolucci (1981) states that sports tourism is a type of tourism in which sport is the main motive of traveling.

The fact is that there is a growing trend in sports and health care in the world, and it is not surprising that most of the worlds most famous destinations focused on the development of sports and recreational tourism as one of the most important forms of selective tourism in the overall tourist offer. The



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development of sport tourism actually represents a unique response to the phenomena of “mass tourism” and “seasonality of tourism” which represent one of the greatest challenges in tourism industry because of numerous negative effects and consequences. In order to minimize these consequences, all tourist destinations put a lot of efforts in order to exceed the tourist season. One of the possible ways is development of specific types of tourism such as sports tourism, MICE tourism, health tourism etc. (Vukonic, & Cavlek, 2001).

However, it is important to mention that the overcoming of the challenge is not the only nor the most reason for development of sports tourism. Something that is crucial are the social advantages as well as economic benefits achieved through development of this type of tourism. It increases the diversity and quality of tourist offer as well motivation of tourists for a particular tourist destination and their consumption. According to Bartoluci (2004), the sports tourism appears in various forms, such as: competitive sports tourism, winter sports and recreational tourism, summer sports and recreational tourism.

In literature it is also possible to find some other forms of sports tourism such as: observation tourism in which tourists are traveling in order to spectate certain sports events or of sports facilities, Recreational tourism in which tourist participate in sports related events, Adventure tourism that provides opportunities for activities such as walking, hiking, canyoning, biking, rafting, paragliding and hang gliding, horse riding, rowing, etc., Natural Tourism etc.

Sports tourism in Montenegro- trend and perspectives

Extremely favorable natural conditions and the fact that sports tourism represent one of the most dominant types of tourist movements leads to conclusion that in the future, Montenegro should pay great attention to the development of this form of tourism (Hinch, & Higham, 2001). However, it is clear that natural factors are important, but not a sufficient factor of attractiveness when it comes to the development of this type of tourism.

Therefore, in the future, it is necessary to pay great attention to development and improvement sports tourism infrastructure. In order to conceive sports tourism in the optimal way, it is necessary is to segment the offer through its spatial differentiation and specialization for certain sports (Montenegro's Tourism Development Strategy to 2020, 2008). This would make sports tourism a segment of the offer in certain ones places and regions that have the greatest potential for a particular sport, for example: nautical sports and sailing - Boka Bay; tennis, volleyball - Budva; Handball - Cetinje; winter sports - Zabljak, Kolasin, Plav, Rozaje; rafting, kayaking and canoeing on fast waters - Tara and Moraca; golf - Tivat, Zabljak, Ulcinj; athletics - Bar, Ulcinj; swimming - coastal region; kayak and canoe in calm waters - Skadar Lake etc.

Having on mind the fact that tourists dependent on excitement are one of the most numerous tourist groups, and the fact that Montenegro has fantastic conditions for enjoying extreme sports, it is quite clear why in the future this sub-segment should be given great attention. The special accent should be put on paragliding, bungee jumping, parachuting, water formula, auto racing, water skiing, water jumping, snowboarding, etc. In addition, it should also focus on promotion of mountaineering and alpinism with special emphasis on Orjen, Lovcen, Durmitor, Bjelasica and Prokletije.

It is also important to mention the fact that golf tourism represents one of the most demanding segments of tourism demand. Regardless of the continuous increase the number of people who play golf, it still contains a certain amount of prestige, similar to nautical sport. Therefore, all strategic acts regarding tourism development in Montenegro, recognize golf tourism as one the most important segments of sports tourism development. It is known that for the location of golf courses the closeness of airport is very important, so it that's why is planned to build such resources in Tivat. In addition, it is proposed to examine sterile and macchia terrain on the coast (in Boka area and between Bar and Ulcinj) and in the continental areas near the future airports in Berane, Zabljak and Niksic. Also, there is a possibility of the realization of cross-border cooperation with Dubrovnik in order to realize joint investments and marketing promotion on global tourist market.

The strategy of golf development in Montenegro suggests orientation to main target groups:

1. Local population: Promoting golf among the local population at the very beginning of the is a crucial for sustainability of Strategy. Strategic management of marketing activities in Montenegrin tourism would improve golf engagement among Montenegrin citizens through golf schools, competitions, special prices for travel arrangements involving golf, etc.

2. Golfers on vacation: Tourists on vacation are looking for animations. Such tourists would probably stay in a summer resort during a holiday and occasionally played golf.

3. Golf tourists: Dedicated golfers with a significantly higher chance of being Golf club members, who are older, richer, are more interested in golf packages and to visit a large number of golf courses across the country / region. According to rule, they have very high incomes and high demands (Golf Strategy in Montenegro, 2009).

The development of this type of tourism would contribute not only to diversification and the improvement of quality of tourist offer in Montenegro, but would also contribute to the development of business, attracting investments, increasing employment etc.

It would be also interesting to develop sports tourism together with some other types of selective tourism forms such as speleological tourism for example. According to trends and perspectives on international market, it is clear that speleological tourism occupies more important place than ever before and more and more tourists decide to travel motivated by the desire to meet the beauty of the underworld. Having on mind the fact that the development of this kind of tourism is closely related to development of sports tourism from many different points of view (type of tourists, good physical condition as necessary prerequisite for enjoying in speleological activities etc.), as well as the exceptional potential of Montenegro it is clear that in future accent should also be put on combination of these activities. According to Radovic (2010), the most important localities are: Red Rock which is usually compared with famous locality El Castile in Spain, Lipa Cave, Cetinje Cave etc. However, despite the large number of imposing speleological objects, Montenegro has no any cave which is facilitated for touristic visits, on which great attention should be put in future.

All other types of tourism such as sea tourism, mountain tourism, health tourism, cultural tourism, rural tourism etc. should be further enriched with segments of sports tourism which would attract more different target groups, significantly

improve the quality of tourist offer, improve the quality of tourists satisfaction etc.

Conclusions

Having on mind the fact that sports tourism represents one of the key driven forces of future tourism development, and the fact that Montenegro has a great potential for development of this type of tourism, it is clear why in future the great attention should be put on development of this kind of tourism. It is clear that there Montenegro has a lot of resources that should be used for development of sports tourism such as natural beauties, sea, mountains, national parks etc., but it should point out that natural beauties and potentials are important but not sufficient for future tourism development and in that sense in future it should focus on investment in sports infrastructure, systematic and strategic approach to creation of unified diversified tourism offer and high quality promotion on international market. Except to the fact that sports tourism may significantly contribute to the solving of problems of seasonality, it may also significantly contribute to the improvement of diversity and quality of tourist offer, the increase of level of satisfaction of tourists, the increase of expenditure in destination itself etc.

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SHORT REPORT

Organizing Manage of International Half Marathon “Run for Peace and Tolerance”

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Abstract

Now that sport is in step up with time and other technologies, and it is imposed also the attending of sport's organizing, from the minor to the grand organizing and all of them bring benefits not only to federation but to the country too, in order of presentation of the best as it's possible, so all this depends mainly by respecting some specific rules, tasks, structure and organizing to what this event is organized for. In this work we present a model of managing the organizing the half marathon activity which is organized for many years, which is known also in the international area. This work paper deals with organizing of this competition that is named as an international activity for many years. This work paper is dealt with organizing of this competition that already has a long experience and within itself we find the organizing forms and hierarchy from the top to the competitors that does its activity on track. This form of organizing is done in the line Kosovo Athletic Federation, Ministry of sports and sponsors that is support in continuity this international competition. In this international half-marathon participants were 900 athletes from over 40 countries, then in organizing is provided awards in money and according to the age and psych-physical abilities that are presented in chart.

Key words: federation, athletics, half-marathon, organizing, registration, sponsors

Introduction

For organizational management of sports organizations, special contribution work have given many authors about the organization in clubs, fitness centers and large sports and recreational centers, about their specifics (Bartoluci, 1997; Bartoluci & Skoric, 2009; Bartoluci & Cavlek, 1998; Tomic, 2001; Lalazi, 2011; Tahiraj, 2008). Today, sport is an activity of society that has gained tremendous development and has become a base for the functioning of this society (Rizvanolli & Shyti, 2011). Today sport is following the development of technologies, the broadcast of sports events increases with better presentation every time thanks to all these great benefits, so it depends mainly on respecting some rules, tasks and structure, and this is presented as a model for organizing and sponsoring a sports club (Tahiraj, Miftari, Damo, & Shatri, 2014). Modern

marathons and long distance running is a sporting industry that has recently gained popularity and global success that is growing (Belovski, 2014). The activity as a half marathon brings together many athletes around the world, doing races, visits and tourism, which serves not only as a break but also as the main and common motivation for the destination (Bartoluci & Cavlek, 1998).

The Athletic Federation of Kosovo (AFK) is a sports association of united sports organizations, organized to promote the development and progress of athletics sport in the country and to achieve common goals and interests in accordance with the Law on Sport. The Kosovo Athletic Federation was founded in the founding assembly on 25 September 1991 in Prishtina. Its field of activity is in the territory of Kosovo, and the Athletic Federation of Kosovo consists of all forms of or-



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ganization of amateur or professional sports activities, sports organizations - athletic clubs and professional associations, which are organized and act in accordance with the Law. AFK relations are based on the principles of justice, equality and community of sports organizations.

The Kosovo Athletics Federation is a member of the Kosovo Olympic Committee, which is also a member of the International Association of Athletic Federations (IAAF), the European Athletics Association (EAA) and the Balkan Asso-

ciation of Athletic Federations (ABAF), whose work orients it on the basis of respecting the rules and regulations of these associations. The Athletic Federation of Kosovo functions as a non-profit and non-political organization. Kosovo Athletics Federation's seat is in Prishtina. The symbol of the Kosovo Athletic Federation consists of an ellipse ring (red) symbolizing the path of athletics and abbreviation of the federation - FAK of black and white, where letter a itself contains the symbol of the runner (Figure 1).



Figure 1. Symbol of the athletic federation of Kosovo

Organizational structures of half marathons and specifications

The structure of organization can be defined as a group interrelated and in the relationship between elements in the organization (Tomic, 2001). The athletic federation of Kosovo has 13 clubs with 30 senior, 35 senior, 35 junior, 60 juniors, 20 cadets, 40 cadets, 40 pioneers, 60 pioneers. Registered are a total of 195 men and 125 women. The Athletic Federation is a legal person registered in the register of sports organizations with the competent state authority. AKF operates a bank account and for all liabilities, it responds by all means. In the continuation of the biggest activities the AFK, the Ministry of Culture Youth and Sports, the Directorate for Sports and Youth of the Municipality of Prishtina organized the International

half marathon of Prishtina for the eighteenth (18) time on April 29, 2018. This international contest as well as other years has symbolized the values of peace, tolerance, coexistence and the perfection of sport.

More than 1,300 participants from around 40 countries participated in this competition, they were delighted with the organization of this half marathon in an atmosphere with a diversified program. The organizers have thought that the positive experience of the past years has motivated even more participants to enjoy this contest, which at the same time is cheerful and competitive.

Those participants who finished the race were awarded with certificates and the best were awarded with prize money (Tables 1, 2, 3).

Table 1. Race categories and prize moneys according to placement

	Senior		Veteran		5 km race		Hendikos	
	Male	Female	Male	Female	Male	Female	Male	Female
1	1200 EUR	1000 EUR	300 EUR	300 EUR	150 EUR	150 EUR	50 EUR	50 EUR
2	900 EUR	700 EUR	200 EUR	200 EUR	100 EUR	100 EUR	30 EUR	30 EUR
3	700 EUR	400 EUR	100 EUR	100 EUR	70 EUR	70 EUR	20 EUR	20 EUR
4	500 EUR	300 EUR						
5	400 EUR	200 EUR						
6	300 EUR	100 EUR						
7	200 EUR							
8	100 EUR							

The total value of over 12,000 EUR has been distributed to the top runners in the senior category, three in the category of veterans, three in the category of 5km and three in the category of disabled riders. All the categories mentioned in the prizes have been awarded to participants in both sexes (male and female). The structure of the Half Marathon Management Board consisted of: 100 members of umpires committee, 5 members of marketing committee, 2 members

of information committee, 7 members of technical works committee, 3 members path insurance, 5 members healthcare, 3 members membership registration, accommodation 3 members and 3 members rewards committee. So all of these committees have been close members who have worked under the AFK umbrella, and every committee man has had many volunteers and specifics (Figure 2).

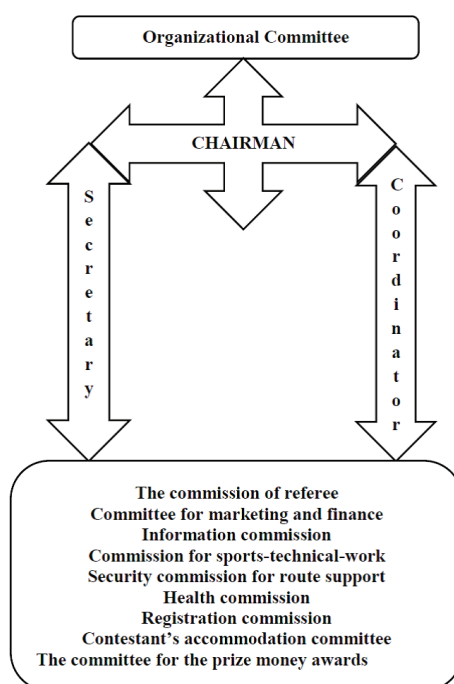


Figure 2. Structure of the Organizational Committee of half marathon

Permanent sponsors since 2001 are Pro Credit Bank, European Union (Office Prishtina), Bonita (water supplier), Meridian (drinks), Sportingu (sports equipment), Visi (Immovable Property Agency), Toifor (Mobile Water Closet). Auxiliary

Institutions of the race are Kosovo Police, First Aid Center, Faculty of Physical Culture, University College- Eurosport, Palace of Youth and Sports, National Theater, Etc.

Table 2. Veterans category first place (21 km race)

Male		Female	
Over 50 years	50 EUR	Over 45 years	50 EUR
Over 60 years	50 EUR	Over 55 year	50 EUR

Specific half marathon activities and agenda

The registration of the runners was held in Prishtina from 20-28 April 2018 from 9:00 to 18:00. The participation for locals was 5.00 EUR while participation for internationals 10.00 EUR.

On the race day the car parking was unavailable and in advance the information was in the media that spectators should come walking to the point of departure. The registration took place in front of the National Theater. Participants were equipped with shirts and starting numbers. The participants were at the departure point in front of the National Theater at 09:30 and no later than 15 minutes before the start of the race, between 09:45 and 10:00 was a brief briefing about the race.

On the activity day, the 21 km run started at 10:00 on 29 April 2018, while the 5 km race started after the first run. Meanwhile, the 2 km race (for young people) was also on the schedule that was the second run.

The starting number was given to the runners during registration. The numbers should be placed on the chest before

the start of the race and should be completely visible. Those runners who were tracked without number were disqualified.

The Marathon route was as follows: National Theater, Mother Theresa Street, main traffic lights (right turn), path to Fushe Kosove/Kosovo Polje, from Fushe Kosova towards Obiliq/Obilic road, then to Mitrovica-Prishtina highway to district and back to the National Theater. Along the way there were clear signs of past mileage, jogging paths, refreshments, and first aid stations.

In this competition some runners had to give up the race before the end of the foreseen race and left the trail. In such cases, the runner was required to remove the runner number and wait for the bus to gather competitors who cannot run until the end. The path officials watched closely each runner and every attempt to stop other competitors, then shortening of the run resulted with the immediate disqualification of the runner.

The winners' ceremony started at 12:30 in front of the National Theater. All the participants who finished the race received the certificates of Prishtina's international half marathon.

Table 3. Prize money for local runners (5 km race)

	Male	Female
1	200 EUR	200 EUR
2	100 EUR	100 EUR
3	50 EUR	50 EUR

Discussion

This half-carnival had its effect both as a specific form of society with sport now and as an industry process from which this activity passes in joy and fun together with the commercialization of sport (Dzeba & Serdarusic, 1995).

The role of this management organization for this competition is to provide this organizational team to have better future conditions for the race, to guide the maintenance and health care of runners, sponsors to be satisfied with the organization itself and all other participants and spectators. The link chain should be in the relationship with the human resources to make the racing event more appealing for active and passive participants.

Further promotion of the federation for a more enjoyable budget should be for the promotion and creation of the most suitable conditions for the coming year, which should be preceded by a strategic plan that in the future will be even more inclusive in order to influence the growth of participants and interest groups. Then training of other professional and volunteer resources before racing and rational use of time and budget by being managed by people calling or looking at any future company that has the experience and other specified knowledge and this should be done with the professional structures of the federation and other interest groups.

And then, to have a better and coordinated organization, there should be human resources in the professional aspect, where it will also help bring many sponsors, then the results will be recorded and the interests can now be linked (Tahiraj et al., 2014).

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Conflict of Interest

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EDITORIAL

Who Play for the National Football Team of Montenegro, Montenegrins or “Montenegrins”?

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Abstract

The research question in this paper was set in order to answer the question of who is playing for the national football team of Montenegro, whether “modern Montenegrins” or “ethnic Montenegrins”, that is, to try to explain in a practical way how the inhabitants of Montenegro should experience the nation, and how ethnicity. By analysing the current circumstances, it has been determined that for the national football team of Montenegro exclusively inhabitants can play, that is the citizens of Montenegro, regardless of their ethnicity, religion or some third affiliation at a lower level of value while ethnic Montenegrins from Diaspora cannot play for the national football team of Montenegro because they do not hold Montenegrin citizenship. Therefore, it is not difficult to conclude that only members of one nation can play for a national football team, and in the Montenegrin case, they are inhabitants, that is, citizens of Montenegro.

Key words: football, nation, national identity, ethnicity

Introduction

There is a lot of interest among the citizens of a country, both nationally and personally, for the success of their national teams. This success leads people to have the opportunity to empower national pride and belonging to the social group they belong to. Whether it is sports games, or individual sports, or any other competition, most sympathizer or fans of a particular team have a passion and a desire to win, and those feelings are the strongest when it comes to national teams. It is in the nature of a man to identify himself with the successes of the social group he belongs to; however, especially in the territory of the former Yugoslavia, but also in some other countries around the world, it is still not clearly demarcated to which national group they really belong, since, in certain social communities, a clear social attitude is not taken about what is a nation and what is ethnicity, and how citizens should experience these two well-known but very complex terms. Often, the term “religion” intertwines between the two aforementioned terms, and introduces even greater confusion in the definition of modern nations.

A large number of research questions are asked in order to answer the question considering which nation or ethnic group we belong to, while there are also a number of theories on nationalism that recommend approaches that will give meaningful answers and solve practical issues in this field; however, clear answers to the questions asked do not exist yet, as there is no consensus among the participants in the dialogue. Therefore, the author decided to set up a research question that refers to the fact who is playing for the national football team of Montenegro, and in a practical way he tries to clarify how the citizens of Montenegro should experience the nation, and how ethnicity, i.e. to offer a solution which would alleviate inter-ethnic intolerance and strengthen national identity and group cohesion in Montenegrin society at large.

Nation and theories of nationalism

In order to answer the raised research question, it is worth to start from defining the nation and understanding the theory of nationalism, which, from the theoretical point of view, is the answer to the raised research question. However, it is known



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that it is very difficult with “dry” theory to reach citizens and their stands, but the theory is necessary as a strong basis in the process of proving any scientific legality and, therefore, in the creation of social values. Furthermore, in order to deal with certain problems in practical ways, when it comes to the study of nations and nationalism, or one of their main products, a national identity in contemporary society, it is necessary to process available literature in this field. First, it should start from the fact that one nation, according to Popovic and Bjelica (2013), can be considered a group of people who share a genetic background and lives under the same conditions, i.e., possesses common and distinctive elements of culture, then has a unique economic system, an equal right to citizenship, have a sense of solidarity stemming from common experience and occupies a common territory, while the study of nationalism is spanned by using different terms to describe a similar or identical concept. Kellas (1998) has divided studies that have studied nationalism in two main approaches, primarily on instinctive and contextual, and then Cronin (1999) places them in primordialism, etatism, political mythology and modernism, while Smith (2001) divides them into perennialism, primordialism, ethnosymbolism and modernism. Each of these approaches can be widely categorized, and contemporary authors agree that there is an ethnic and modernist approach in the study of nationalism (Popovic & Bjelica, 2014). The differences that appear between these two approaches are based on views that differ in relation to the “birthday of the nation”. Ethnic nationalists believe that nations existed even before the last decade of the 18th century, while modern nationalists recognize nations as the creation of the 18th and 19th centuries (Hastings, 1997). Therefore, it is very important for a Montenegrin circumstances to determine whether to accept first or the second approach. Ethnic nationalism offers the option that the Montenegrin nation consists exclusively of “ethnic Montenegrins”, which according to the 2011 census do not exceed more than 50% (Monstat, 2011), while modern nationalism binds nationality for citizenship, as in most European countries, and in that case the Montenegrin nation was made of all inhabitants, i.e. citizens of Montenegro, who could be called “modern Montenegrins”. With the right approach, the creation of a national identity that would raise the level of cohesion among the citizens of Montenegro, would direct them to work together towards achieving goals for the benefit of the entire community. However, there is still an open question in Montenegro, and there is a lot of misunderstanding when talking about national and ethnic, and the clarification of these dilemmas, for which there is no clear social consensus, are of great social significance to be clarified.

Who can play for the national football team of Montenegro?

Since football is the most popular sport in the world, and since every success of the national football team promotes national pride and its prestige internationally, provokes national pride and empowers national identity, it is no coincidence that for the needs of this study a national football team was taken as an example, because even the Montenegrins do not lag behind other countries of the world when we talk about love for football. Nevertheless, no one looks at the following questions, which, with proper analysis, could give important answers to a number of socially topical issues: who can play for the national football team of Montenegro, whether only those who feel

like “ethnic Montenegrins”, all those who have the citizenship of Montenegro, or those who do not have, or do not feel like Montenegrins? Can those who have, solely Montenegrin citizenship, play for another national football team or FIFA propositions do not allow it, or do those who feel “ethnic Montenegrins” and do not possess Montenegrin citizenship can play for the national football team of Montenegro? Let’s start from the beginning. FIFA (FIFA, 2000) propositions clearly define that for the national team of a country exclusively citizens of that country can play, that is, those footballers who have the citizenship of that country. Therefore, for the national football team of Montenegro, only citizens of Montenegro, or all those who have Montenegrin citizenship, can play, regardless of how they feel considering ethnicity or religion, that is, any third social division. Also, for the Montenegrin national football team players who feel like ethnic Montenegrins, but do not have Montenegrin citizenship cannot play, which clearly tells us that those who consider themselves “ethnic Montenegrins” cannot play for the national team for example players from Diaspora, but only players who have Montenegrin citizenship. The same is the case with Montenegrin citizens of another ethnicity, who can play, exclusively for their national team, that is, for the national football team of Montenegro. Therefore, it is interesting to put emphasis on the word “national” in the construction of the “national football team”, i.e. with the explanation of the name of the state team, pointing out to the fact that in daily communication, these terms are used which give us an answer to the question of what represents nation and ethnicity. By agreeing to the daily use of this term, the message of approach is clearly sent out when the dilemma considering theories about nationalism are concerned, that is, the modernist approach is widely applied in Montenegro. Therefore, it is important to point out that most of Montenegrin citizens do not mind that the national team is set of players that are the same nation, composed of players of different religious and ethnic backgrounds, as well as other minority groups. What does this mean in practical terms? This means that the nation is not represented by people with personal feelings about the biological background of their ancestors, but people who are citizens of one state, and that every citizen of Montenegro has the same right to participate in the national football team, in accordance with his football qualities, and independently of his race, ethnicity or religion, or any other diversity at the national level. Furthermore, it is worth pointing out that it is evident that a significant number of people, but also political leaders, although their political entities are called civil, still have resistance to the modernist approach; however, the question arises what is the basis of the above resistance: whether the blind monitoring of their political leaders who did not clearly and reasonably explained the possibilities of our choices, whether due to mere spite of one political party to another one, or from a third cause known to them. All in all, the fact is that a multi-ethnic and multi-confessional society, such as the Montenegrin, has a strong need to strive for the modern social trends of the modern world, in order to close the issues of separation and open issues of communion and development.

As there is a part of the citizens of Montenegro who oppose the modernist approach, there are other countries in the world where their citizens are also opposing contemporary and modern ideas, or striving for conservative approaches. If we take examples from the countries that are members of the European Union, which should be an example, since they are precisely

the bearers of modern social values, the issue of the national identity in Spain, i.e. the strengthening of the identity of the ethnic group in one of the Spanish provinces, in Catalonia, then in Belgium, where there is still a strong conflict between the ethnically distinct Flemings and the Valonians, who, with a lot of bitterness, gather around the Belgian national flag. Such issues are noticeable in other countries outside the European Union, such as, for example, in Macedonia, that is, the part of the inhabitants of Macedonia who are ethnic Albanians, in Bosnia and Herzegovina, at the level of state entities, inhabited by citizens of the Orthodox, Catholic and Muslim religion, and also in China, or in Taiwan, where the islanders promote their specificity, but also in Turkey, which has a clearly established modernistic approach at the state level, however, in the Kurdish region where exists open issues of similar character, and this very strong state has not yet fully managed to integrate the mentioned ethnic group. All in all, these issues can be solved exclusively by state-level consensus; however, in many cases such a consensus represents an impossible mission.

Conclusion and recommendations

From all of the aforementioned, it is a fact that for the national football team of Montenegro exclusively citizens of Montenegro can play, that is, all those who pass the strict selection by the Football Association of Montenegro in all age categories of their national teams. In this way, we come to the conclusion that Montenegrins play for the national football team of Montenegro, that is, players who are in the first place Montenegrin citizens, i.e. they have a valid Montenegrin citizenship. Therefore, it is not wrong to conclude that the national team consists of the elected representatives of one nation or the Montenegrin nation in this case, regardless of their ethnicity, religion, or some third affiliation which makes them different from other citizens of their country. On the other hand, the question arises: what about the part of Montenegrins, that is, those who make the ethnic Montenegrin group, whether they should be the most important citizens or have any benefits in relation to other ethnic groups in the multi-ethnic and multi-confessional society like Montenegro? Of course not, it would be wrong to offer any benefits to any ethnic group within a nation, as this would lead to the collapse of cohesion in society, that is, the interethnic intolerance would be heightened, which is not of interest to any of the ethnic or any other minority groups.

Nevertheless, despite clearly defined guidelines at the theoretical level, in Montenegrin society, in practical terms, the theory is still not accepted at an adequate level, we are witnesses of frequent falls at sports, especially football stadiums, which are aimed at rebuilding inter-ethnic and among-confessional intolerance. In order to adequately neutralize such extreme cases, which still do not have a wide application, social responsibility

is of great importance, primarily the academic community in Montenegro, then political subjects, especially those whose programs do not clearly define guidelines for clarifying these very important issues one independent state, as well as sports subjects, such as national associations, clubs and players, whose clearly defined messages can quickly reach the citizens of Montenegro and influence their attitudes and beliefs.

Finally, for the sake of a better future and a calmer life, reducing multi-ethnic and multi-confessional intolerance, and then raising social cohesion, which would allow us to focus more on socially topical issues for the purpose of economic development, we should appeal to all citizens of Montenegro, to accept the modernist approach to nationalism, which is widespread in developed countries in Europe and the world. We should agree with the fact that ethnic and religious, as well as any other specificity among Montenegrin citizens and members of the Montenegrin modern nation, should be cultivated at lower levels the level of significance within the family and members of minority groups, through various conferences and cultural programs, which the state should equally support in all its segments. Such an approach should be in the interest of all citizens, because it would save a lot of energy spent on ethnic, religious and other minority issues, which could be focused on current issues of interest to social prosperity and economic society development in which we all live and work together.

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Revised September 2017

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Format the manuscript in A4 paper size; margins are 1 inch or 2.5 cm all around.

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Use Times New Roman font, size eleven (11) point.

Number (Arabic numerals) the pages consecutively (centering at the bottom of each page), beginning with the title page as page 1 and ending with the Figure legend page.

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Talent Identification Criteria

Vazjwar Matin¹ and Stig Arve Sæther¹

¹University of Science and Technology, Department of Sociology and Political Science, Trondheim, Norway

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Word count: 2,946

Abstract word count: 236

Number of Tables: 3

Number of Figures: 0

2.1.1. Title

Title should be short and informative and the recommended length is no more than 20 words. The title should be in Title Case, written in uppercase and lowercase letters (initial uppercase for all words except articles, conjunctions, short prepositions no longer than four letters etc.) so that first letters of the words in the title are capitalized. Exceptions are words like: "and", "or", "between" etc. The word following a colon (:) or a hyphen (-) in the title is always capitalized.

2.1.2. Type of publication

Authors should suggest the type of their submission.

2.1.3. Running head

Short running title should not exceed 50 characters including spaces.

2.1.4. Authors

The form of an author's name is first name, middle initial(s), and last name. In one line list all authors with full names separated by a comma (and space). Avoid any abbreviations of academic or professional titles. If authors belong to different institutions, following a family name of the author there should be a number in superscript designating affiliation.

2.1.5. Affiliations

Affiliation consists of the name of an institution, department, city, country/territory (in this order) to which the author(s) belong and to which the presented / submitted work should be attributed. List all affiliations (each in a separate line) in the order corresponding to the list of authors. Affiliations must be written in English, so carefully check the official English translation of the names of institutions and departments.

Only if there is more than one affiliation, should a number be given to each affiliation in order of appearance. This number should be written in superscript at the beginning of the line, separated from corresponding affiliation with a space. This number should also be put after corresponding name of the author, in superscript with no space in between.

If an author belongs to more than one institution, all corresponding superscript digits, separated with a comma with no space in between, should be present behind the family name of this author.

In case all authors belong to the same institution affiliation numbering is not needed.

Whenever possible expand your authors' affiliations with departments, or some other, specific and lower levels of organization.

2.1.6. Corresponding author

Corresponding author's name with full postal address in English and e-mail address should appear, after the affiliations. It is preferred that submitted address is institutional and not private. Corresponding author's name should include only initials of the first and middle names separated by a full stop (and a space) and the last name. Postal address should be written in the following line in sentence case. Parts of the address should be separated by a comma instead of a line break. E-mail (if possible) should be placed in the line following the postal address. Author should clearly state whether or not the e-mail should be published.

2.1.7. Manuscript information

All authors are required to provide word count (excluding title page, abstract, tables/figures, figure legends, Acknowledgements, Conflict of Interest, and References), the Abstract word count, the number of Tables, and the number of Figures.

2.2. Abstract

The second page of the manuscripts should be the abstract and key words. It should be placed on second page of the manuscripts after the standard title written in upper and lower case letters, bold.

Since abstract is independent part of your paper, all abbreviations used in the abstract should also be explained in it. If an abbreviation is used, the term should always be first written in full with the abbreviation in parentheses immediately after it. Abstract should not have any special headings (e.g., Aim, Results...).

Authors should provide up to six key words that capture the main topics of the article. Terms from the Medical Subject Headings (MeSH) list of Index Medicus are recommended to be used.

Key words should be placed on the second page of the manuscript right below the abstract, written in italic. Separate each key word by a comma (and a space). Do not put a full stop after the last key word. See example:

Abstract

Results of the analysis of

Key words: *spatial memory, blind, transfer of learning, feedback*

2.3. Main Chapters

Starting from the third page of the manuscripts, it should be the main chapters. Depending on the type of publication main manuscript chapters may vary. The general outline is: Introduction, Methods, Results, Discussion, Acknowledgements

(optional), Conflict of Interest (optional). However, this scheme may not be suitable for reviews or publications from some areas and authors should then adjust their chapters accordingly but use the general outline as much as possible.

2.3.1. Headings

Main chapter headings: written in bold and in Title Case. *See example:*

- ✓ **Methods**

Sub-headings: written in italic and in normal sentence case. Do not put a full stop or any other sign at the end of the title. Do not create more than one level of sub-heading. *See example:*

- ✓ *Table position of the research football team*

2.3.2 Ethics

When reporting experiments on human subjects, there must be a declaration of Ethics compliance. Inclusion of a statement such as follow in Methods section will be understood by the Editor as authors' affirmation of compliance: "This study was approved in advance by [name of committee and/or its institutional sponsor]. Each participant voluntarily provided written informed consent before participating." Authors that fail to submit an Ethics statement will be asked to resubmit the manuscripts, which may delay publication.

2.3.3 Statistics reporting

SM encourages authors to report precise p-values. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Use normal text (i.e., non-capitalized, non-italic) for statistical term "p".

2.3.4. 'Acknowledgements' and 'Conflict of Interest' (optional)

All contributors who do not meet the criteria for authorship should be listed in the 'Acknowledgements' section. If applicable, in 'Conflict of Interest' section, authors must clearly disclose any grants, financial or material supports, or any sort of technical assistances from an institution, organization, group or an individual that might be perceived as leading to a conflict of interest.

2.4. References

References should be placed on a new page after the standard title written in upper and lower case letters, bold.

All information needed for each type of must be present as specified in guidelines. Authors are solely responsible for accuracy of each reference. Use authoritative source for information such as Web of Science, Medline, or PubMed to check the validity of citations.

2.4.1. References style

SM adheres to the American Psychological Association 6th Edition reference style. Check "American Psychological Association. (2009). Concise rules of APA style. American Psychological Association." to ensure the manuscripts conform to this reference style. Authors using EndNote® to organize the references must convert the citations and bibliography to plain text before submission.

2.4.2. Examples for Reference citations

One work by one author

- ✓ In one study (Reilly, 1997), soccer players
- ✓ In the study by Reilly (1997), soccer players
- ✓ In 1997, Reilly's study of soccer players

Works by two authors

- ✓ Duffield and Marino (2007) studied
- ✓ In one study (Duffield & Marino, 2007), soccer players
- ✓ In 2007, Duffield and Marino's study of soccer players

Works by three to five authors: cite all the author names the first time the reference occurs and then subsequently include only the first author followed by et al.

- ✓ First citation: Bangsbo, Iaia, and Krstrup (2008) stated that
- ✓ Subsequent citation: Bangsbo et al. (2008) stated that

Works by six or more authors: cite only the name of the first author followed by et al. and the year

- ✓ Krstrup et al. (2003) studied
- ✓ In one study (Krstrup et al., 2003), soccer players

Two or more works in the same parenthetical citation: Citation of two or more works in the same parentheses should be listed in the order they appear in the reference list (i.e., alphabetically, then chronologically)

- ✓ Several studies (Bangsbo et al., 2008; Duffield & Marino, 2007; Reilly, 1997) suggest that

2.4.3. Examples for Reference list

Journal article (print):

- Nepocatych, S., Balilionis, G., & O'Neal, E. K. (2017). Analysis of dietary intake and body composition of female athletes over a competitive season. *Montenegrin Journal of Sports Science and Medicine*, 6(2), 57-65. doi: 10.26773/mjssm.2017.09.008
- Duffield, R., & Marino, F. E. (2007). Effects of pre-cooling procedures on intermittent-sprint exercise performance in warm conditions. *European Journal of Applied Physiology*, 100(6), 727-735. doi: 10.1007/s00421-007-0468-x
- Krstrup, P., Mohr, M., Amstrup, T., Rysgaard, T., Johansen, J., Steensberg, A., Bangsbo, J. (2003). The yo-yo intermittent recovery test: physiological response, reliability, and validity. *Medicine and Science in Sports and Exercise*, 35(4), 697-705. doi: 10.1249/01.MSS.0000058441.94520.32

Journal article (online; electronic version of print source):

- Williams, R. (2016). Krishna's Neglected Responsibilities: Religious devotion and social critique in eighteenth-century North India [Electronic version]. *Modern Asian Studies*, 50(5), 1403-1440. doi:10.1017/S0026749X14000444

Journal article (online; electronic only):

- Chantavanich, S. (2003, October). Recent research on human trafficking. *Kyoto Review of Southeast Asia*, 4. Retrieved November 15, 2005, from <http://kyotoreview.cseas.kyoto-u.ac.jp/issue/issue3/index.html>

Conference paper:

- Pasadilla, G. O., & Milo, M. (2005, June 27). *Effect of liberalization on banking competition*. Paper presented at the conference on Policies to Strengthen Productivity in the Philippines, Manila, Philippines. Retrieved August 23, 2006, from <http://siteresources.worldbank.org/INTPHILIPPINES/Resources/Pasadilla.pdf>

Encyclopedia entry (print, with author):

- Pittau, J. (1983). Meiji constitution. In *Kodansha encyclopedia of Japan* (Vol. 2, pp. 1-3). Tokyo: Kodansha.

Encyclopedia entry (online, no author):

- Ethnology. (2005, July). In *The Columbia encyclopedia* (6th ed.). New York: Columbia University Press. Retrieved November 21, 2005, from <http://www.bartleby.com/65/et/ethnolog.html>

Thesis and dissertation:

- Pyun, D. Y. (2006). *The proposed model of attitude toward advertising through sport*. Unpublished Doctoral Dissertation. Tallahassee, FL: The Florida State University.

Book:

- Borg, G. (1998). *Borg's perceived exertion and pain scales*: Human kinetics.

Chapter of a book:

- Kellmann, M. (2012). Chapter 31-Overtraining and recovery: Chapter taken from *Routledge Handbook of Applied Sport Psychology* ISBN: 978-0-203-85104-3 *Routledge Online Studies on the Olympic and Paralympic Games* (Vol. 1, pp. 292-302).

Reference to an internet source:

- Agency. (2007). Water for Health: Hydration Best Practice Toolkit for Hospitals and Healthcare. Retrieved 10/29, 2013, from www.rcn.org.uk/newsevents/hydration

2.5. Tables

All tables should be included in the main manuscript file, each on a separate page right after the Reference section.

Tables should be presented as standard MS Word tables.

Number (Arabic) tables consecutively in the order of their first citation in the text.

Tables and table headings should be completely intelligible without reference to the text. Give each column a short or abbreviated heading. Authors should place explanatory matter in footnotes, not in the heading. All abbreviations appearing in a table and not considered standard must be explained in a footnote of that table. Avoid any shading or coloring in your tables and be sure that each table is cited in the text.

If you use data from another published or unpublished source, it is the authors' responsibility to obtain permission and acknowledge them fully.

2.5.1. Table heading

Table heading should be written above the table, in Title Case, and without a full stop at the end of the heading. Do not use suffix letters (e.g., Table 1a, 1b, 1c); instead, combine the related tables. *See example:*

- ✓ **Table 1.** Repeated Sprint Time Following Ingestion of Carbohydrate-Electrolyte Beverage

2.5.2. Table sub-heading

All text appearing in tables should be written beginning only with first letter of the first word in all capitals, i.e., all words for variable names, column headings etc. in tables should start with the first letter in all capitals. Avoid any formatting (e.g., bold, italic, underline) in tables.

2.5.3. Table footnotes

Table footnotes should be written below the table.

General notes explain, qualify or provide information about the table as a whole. Put explanations of abbreviations, symbols, etc. here. General notes are designated by the word *Note* (italicized) followed by a period.

- ✓ *Note.* CI: confidence interval; Con: control group; CE: carbohydrate-electrolyte group.

Specific notes explain, qualify or provide information about a particular column, row, or individual entry. To indicate specific notes, use superscript lowercase letters (e.g. ^{a,b,c}), and order the superscripts from left to right, top to bottom. Each table's first footnote must be the superscript ^a.

- ✓ ^aOne participant was diagnosed with heat illness and n = 19.^bn = 20.

Probability notes provide the reader with the results of the tests for statistical significance. Probability notes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || etc.

- ✓ *P<0.05, †p<0.01.

2.5.4. Table citation

In the text, tables should be cited as full words. *See example:*

- ✓ Table 1 (first letter in all capitals and no full stop)
- ✓ ...as shown in Tables 1 and 3. (citing more tables at once)
- ✓ ...result has shown (Tables 1-3) that... (citing more tables at once)
- ✓in our results (Tables 1, 2 and 5)... (citing more tables at once)

2.6. Figures

On the last separate page of the main manuscript file, authors should place the legends of all the figures submitted separately.

All graphic materials should be of sufficient quality for print with a minimum resolution of 600 dpi. SM prefers TIFF, EPS and PNG formats.

If a figure has been published previously, acknowledge the original source and submit a written permission from the copyright holder to reproduce the material. Permission is required irrespective of authorship or publisher except for documents in the public domain. If photographs of people are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to use the photograph whenever possible permission for publication should be obtained.

Figures and figure legends should be completely intelligible without reference to the text.

The price of printing in color is 50 EUR per page as printed in an issue of SM.

2.6.1. Figure legends

Figures should not contain footnotes. All information, including explanations of abbreviations must be present in figure legends. Figure legends should be written below the figure, in sentence case. *See example:*

- ✓ **Figure 1.** Changes in accuracy of instep football kick measured before and after fatigued. SR – resting state, SF – state of fatigue, * $p > 0.01$, † $p > 0.05$.

2.6.2. Figure citation

All graphic materials should be referred to as Figures in the text. Figures are cited in the text as full words. *See example:*

- ✓ Figure 1
 - × figure 1
 - × Figure 1.
 - ✓ ...exhibit greater variance than the year before (Figure 2). Therefore...
 - ✓ ...as shown in Figures 1 and 3. (citing more figures at once)
 - ✓ ...result has shown (Figures 1-3) that... (citing more figures at once)
 - ✓ ...in our results (Figures 1, 2 and 5)... (citing more figures at once)

2.6.3. Sub-figures

If there is a figure divided in several sub-figures, each sub-figure should be marked with a small letter, starting with a, b, c etc. The letter should be marked for each subfigure in a logical and consistent way. *See example:*

- ✓ Figure 1a
- ✓ ...in Figures 1a and b we can...
- ✓ ...data represent (Figures 1a-d)...

2.7. Scientific Terminology

All units of measures should conform to the International System of Units (SI).

Measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or their decimal multiples.

Decimal places in English language are separated with a full stop and not with a comma. Thousands are separated with a comma.

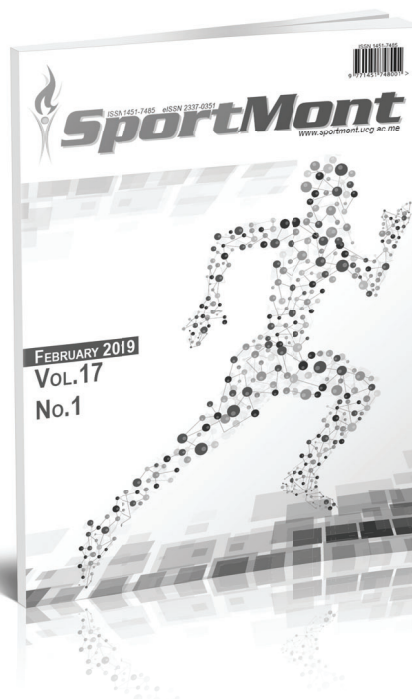
Percentage	Degrees	All other units of measure	Ratios	Decimal numbers
✓ 10%	✓ 10°	✓ 10 kg	✓ 12:2	✓ 0.056
× 10 %	× 10 °	× 10kg	× 12 : 2	× .056
Signs should be placed immediately preceding the relevant number.				
✓ 45±3.4	✓ p<0.01	✓ males >30 years of age		
× 45 ± 3.4	× p < 0.01	× males > 30 years of age		

2.8. Latin Names

Latin names of species, families etc. should be written in italics (even in titles). If you mention Latin names in your abstract they should be written in non-italic since the rest of the text in abstract is in italic. The first time the name of a species appears in the text both genus and species must be present; later on in the text it is possible to use genus abbreviations. See example:

✓ First time appearing: *musculus biceps brachii*

Abbreviated: *m. biceps brachii*



ISSN 1451-7485

Sport Mont (SM) is a print (ISSN 1451-7485) and electronic scientific journal (eISSN 2337-0351) aims to present easy access to the scientific knowledge for sport-conscious individuals using contemporary methods. The purpose is to minimize the problems like the delays in publishing process of the articles or to acquire previous issues by drawing advantage from electronic medium. Hence, it provides:

- Open-access and freely accessible online;
- Fast publication time;
- Peer review by expert, practicing researchers;
- Post-publication tools to indicate quality and impact;
- Community-based dialogue on articles;
- Worldwide media coverage.

SM is published three times a year, in February, June and October of each year. SM publishes original scientific papers, review papers, editorials, short reports, peer review - fair review, as well as invited papers and award papers in the fields of Sports Science and Medicine, as well as it can function as an open discussion forum on significant issues of current interest.

SM covers all aspects of sports science and medicine; all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side.

Prospective authors should submit manuscripts for consideration in Microsoft Word-compatible format. For more complete descriptions and submission instructions, please access the Guidelines for Authors pages at the SM website: <http://www.sportmont.ucg.ac.me/?sekcija=page&p=51>. Contributors are urged to read SM's guidelines for the authors carefully before submitting manuscripts. Manuscripts submissions should be sent in electronic format to sportmont@ucg.ac.me or contact following Editors:

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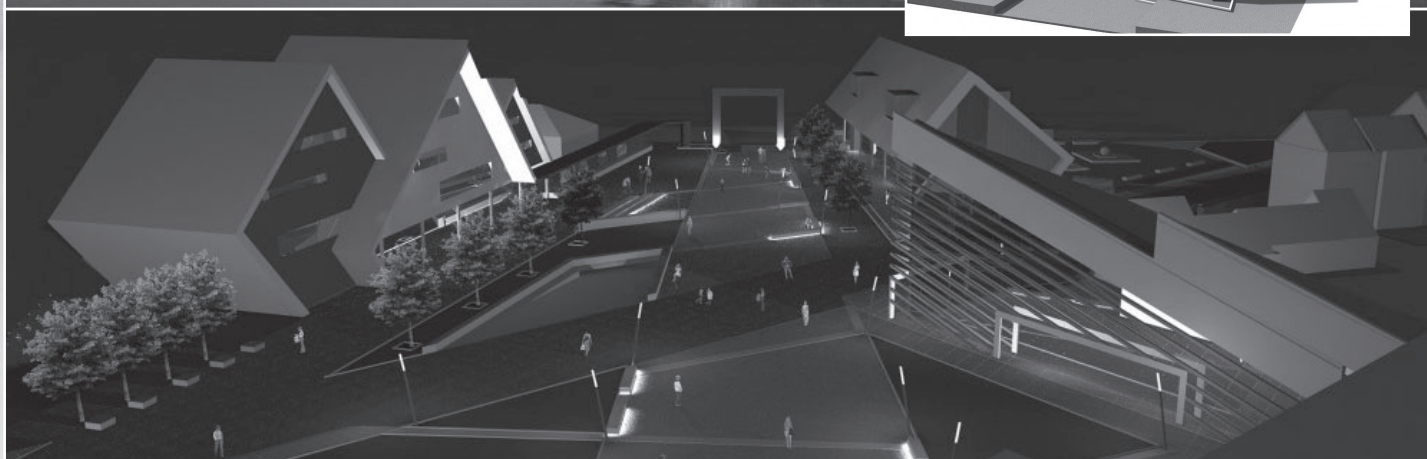
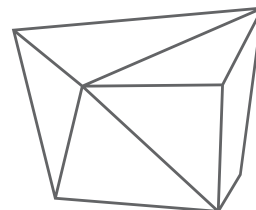
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ARHITEKTONSKI FAKULTET

UNIVERSITY OF MONTENEGRO
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The University of Montenegro is the leading higher education and research institution in Montenegro. It is a public institution, established by the state, operating as a unique legal entity represented by the Rector. It is an integrated university organized on the model of the most European universities. Organizational units are competent for provision of study programmes, scientific-research and artistic work, use of allocated funds and membership in professional associations.

Since its foundation, the University of Montenegro has continuously been conducting reforms in the area of education and research, while since 2003 in line with the trends in EHEA. After adoption of the Bologna Declaration, University of Montenegro organized systematic preparation of documents aligned with it. Already in 2003, the experimental teaching programme started and today, all studies are organised in line with the Bologna principles. During the last two years systematic reforms of the University's study programmes have been conducted in order to harmonize domestic higher education system with European standards and market needs to highest extent.

The University of Montenegro has unique academic, business and development objectives. It comprises 19 faculties and two research institutes. The seat of the UoM is in Podgorica, the capital city, while university units are located in eight Montenegrin towns. The University support services and centers (advisory services, accounting department, international cooperation, career orientation) are located in the Rectorate.

Academic community of University of Montenegro is aware of the importance of its functioning for further development of the state and wider region. It has been so far, and will be in the future, the leader in processes of social and cultural changes, along with the economic development.

In the aspect of attaining its mission, University of Montenegro is oriented towards the priority social needs of the time in which it accomplishes its mission; open for all the students and staff exclusively based on their knowledge and abilities; dedicated to preservation of multicultural and multi-ethnic society in Montenegro; entrepreneurial in stimulating social and economic application of supreme achievements within the scope of its activities.

In 2015/16 there were a total of 1.192 employees at UoM, 845 of which were engaged in teaching. In the same year there were 20.236 students registered at all three cycles of studies.

Internationalization is high on the agenda of UoM priorities, thus it has participated in a number of international projects – over 50 projects funded under the Tempus programme, over 15 Erasmus Mundus Action 2 projects for student mobility, a number of projects under FP7 funding scheme or IPA supported projects, Erasmus + capacity building and International credit mobility projects and other.

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MJSSM is published biannually, in September and March of each year. MJSSM publishes original scientific papers, review papers, editorials, short reports, peer review - fair review, as well as invited papers and award papers in the fields of Sports Science and Medicine, as well as it can function as an open discussion forum on significant issues of current interest.

MJSSM covers all aspects of sports science and medicine; all clinical aspects of exercise, health, and sport; exercise physiology and biophysical investigation of sports performance; sport biomechanics; sports nutrition; rehabilitation, physiotherapy; sports psychology; sport pedagogy, sport history, sport philosophy, sport sociology, sport management; and all aspects of scientific support of the sports coaches from the natural, social and humanistic side.

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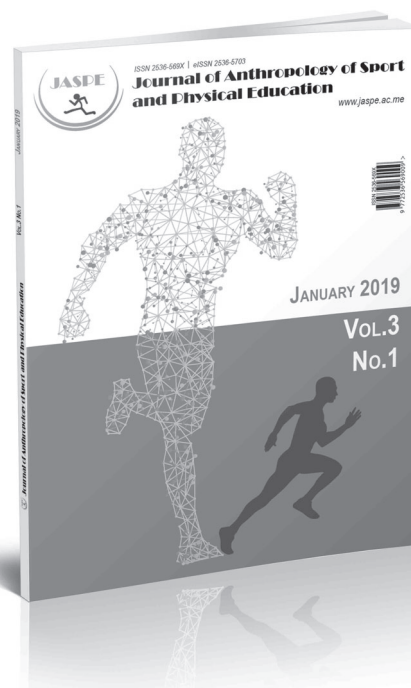
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Journal of Anthropology of Sport and Physical Education



ISSN 2536-569X

Journal of Anthropology of Sport and Physical Education (JASPE) is a print (ISSN 2536-569X) and electronic scientific journal (eISSN 2536-5703) aims to present easy access to the scientific knowledge for sport-conscious individuals using contemporary methods. The purpose is to minimize the problems like the delays in publishing process of the articles or to acquire previous issues by drawing advantage from electronic medium. Hence, it provides:

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Bojan MASANOVIC, *Editor-in Chief* – bojanma@ucg.ac.me

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PODGORICA



Faculty of Law was founded on October 27th, 1972 in Podgorica as a scientific and artistic educational institution, in which educational and research work was organized in the area of law and similar social studies. While making into law the establishment of this institution, Assembly of Socialist Republic of Montenegro highlighted that "The establishment of this institution of high education is necessary for meeting overall demands of the society of the Republic". Faculty of Law is one of the founding fathers of the University of Montenegro.

During the forty-five years of its existence Faculty of Law grew to a modern, contemporary, scientific and artistic educational institution. Forty-five generations studied at the faculty. About 17.000 students enrolled at the faculty and 4285 students graduated from the faculty. About 15 percent of the students studied abroad. Part of the best students continued postgraduate and doctoral studies at prominent university centers. Most of the former students stayed in Montenegro due to family ties. 88 professors and associates worked at the faculty, out of whom there were 26 guest professors. Today most of the professors and cadre at the faculty are former students.

Faculty organizes graduate and postgraduate studies. There

are teaching and cadre resources for organizing specialist and doctoral studies in all the areas of law.

As a university branch Faculty of Law realizes a big number of its planned aims and tasks and finds solutions for many important questions of cadre organization, technical and material problems. With the help of the University of Montenegro, faculty largely develops the international cooperation net.

Faculty follows world trends and achievements in the area of high education with the aim to coordinate its work with European and world demands. This year faculty made the first steps in realization of Bologna declaration. There is enough cadre for all the necessary teaching at the faculty.

The faculty was founded because of expression of need to reach the necessary standard for socio-economic, political, cultural and social development of Montenegro. During its overall existence faculty shared the fate with Montenegrin society. It will continue to do so by making steps towards implementing new practises and creating new relations, with the help of implementation of modern European trends.

The faculty is a complex organization and managing institution nowadays.

Faculty of Economics

University of Montenegro

The Faculty of Economics celebrated its 57th anniversary this year, and it is the oldest higher education institution in the country. Since its establishment, 8,630 students graduated at our Faculty.

Today, Faculty of Economics is a largely interdisciplinary institution, characterized by expressed dynamism in its work. Employees at the Faculty are dedicated to constant improvements and enhancements, all in accordance with the needs brought by the changes.

We provide our students with the best theoretical and practical knowledge, enabling them to develop critical spirit in approaching economic phenomena and solving concrete problems in daily work. From September 2017, at the Faculty, the new generation will start a 3 + 2 + 3 study, which will improve the quality of studying.



Development of Faculty of Economics in the coming period will follow the vision of development of the University of Montenegro, pursuing full achievement of its mission

Comprehensive literature, contemporary authors and works have always been imperative in creation of new academic directions at Faculty of Economics, which will form the basis of our future.

Faculty and its employees are dedicated to developing interest in strengthening the entrepreneurial initiative, creative and interdisciplinary approach among young people, using modern teaching and research methods. In this regard, the Faculty has modern textbooks and adequate IT technology, which supports the objectives set.





UNIVERSITY OF MONTENEGRO FACULTY OF MECHANICAL ENGINEERING Podgorica

www.ucg.ac.me/mf

Mechanical engineering studies in Montenegro started during the school year 1970/71. On April 15th, within the Technical Faculty, the Department of Mechanical Engineering was formed. The Department of Mechanical Engineering of the Technical Faculty was transformed in 1978 into the Faculty of Mechanical Engineering, within the University "Veljko Vlahović". Since 1992 the Faculty of Mechanical Engineering is an autonomous University unit of the University of Montenegro. It is situated in Podgorica.

The University of Montenegro is the only state university in the country, and the Faculty of Mechanical Engineering is the only faculty in Montenegro from the field of mechanical engineering.

Activities of the Faculty of Mechanical Engineering can be divided into three fields: teaching, scientific-research work and professional work.

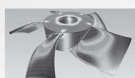
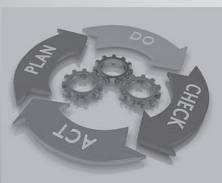
Two study programmes were accredited within the Faculty of Mechanical Engineering:

- Academic study programme MECHANICAL ENGINEERING
- Academic study programme ROAD TRAFFIC

The study programmes are realised according to the Bologna system of studies in accordance to the formula 3+2+3.

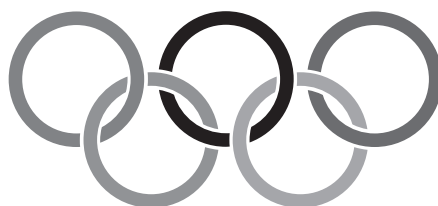
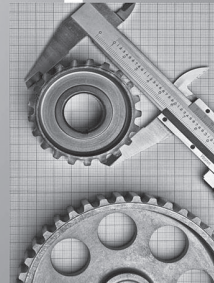
On the study program Mechanical Engineering it is possible to study next modules:

- Mechanical Engineering – Production
- Applied Mechanics and Construction
- Energetics
- Energy Efficiency
- Mechatronics
- Quality



At the Faculty of Mechanical Engineering, as organisational units, there are centres and laboratories through which scientific-research and professional work is done:

- Centre for Energetics
- Centre for Vehicles
- Centre for Quality
- Centre for Construction Mechanics
- Centre for Traffic and Mechanical Engineering Expertise
- Centre for transport machines and metal constructions
- 3D Centre
- Didactic Centre – Centre for Automation and Mechanomics training
- European Information and Innovation Centre
- Cooperation Training Centre
- Laboratory for Metal Testing
- Laboratory for Turbulent Flow Studies
- Laboratory for Vehicle Testing
- Laboratory for Attesting of Devices on the Technical Examination Line



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