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CONTENTS

SELF-CONCEPT DIFFERENCES IN ATHLETES AND ESPORTS PLAYERS	7
Dijana Ivanišević and Haris Šunje	
THE EFFECTS OF THE APPLICATION OF THE WORK TRAINING PROGRAM ON THE TRANSFORMATION OF THE MOTOR SKILLS OF YOUNG BASKETBALL GIRLS AGES 13 TO 15.....	12
Mile Galić, Azer Korjenić and Ante Vučić	
EFFECTS OF A THREE-MONTH PROGRAM ON SWIMMING SPEED USING THE BREASTSTROKE TECHNIQUE.....	16
Edin Mirvić, Dženana Imamović – Turković, Damira Vranešić - Hadžimehmedović, Nermin Nurković and Lejla Šebić	
CORRELATION OF LATENT DIMENSIONS OF FUNCTIONAL MANAGERS IN SPORTS ASSOCIATIONS IN THE COUNTY OF WEST HERZEGOVINA	21
Dženan Šuta, Damir Đedović and Adi Palić	
REASONS FOR ABSENCE FROM CLASSES OF MALE AND FEMALE STUDENTS IN PRIMARY SCHOOLS.....	28
Faris Rašidagić and Dženana Imamović-Turković	
THE TREND OF SPEED AND AGILITY DEVELOPMENT IN FOOTBALL PLAYERS.....	39
Amel Jazvin, Adnan Ademović, Adi Palić, Rijad Novaković and Samir Gosto	
EFFECTS OF A THREE-MONTH PROGRAM ON SWIMMING SPEED WITH THE DOLPHIN TECHNIQUE.....	44
Edin Mirvić, Dženana Imamović – Turković, Damira Vranešić – Hadžimehmedović and Lejla Šebić	
RELATIONS BETWEEN MORPHOLOGICAL CHARACTERISTICS AND PERFORMANCE OF ELEMENTS OF BASKETBALL TECHNIQUE OF 7TH AND 8TH GRADE ELEMENTARY SCHOOL STUDENTS.....	49
Dejan Šumar, Naim Čeleš and Bojan Međedović	
SINGING GAMES AND THEIR APPLICATION IN THE IMPLEMENTATION OF ELEMENTARY GAMES.....	54
Dženana Imamović-Turković and Faris Rašidagić	

SELF-CONCEPT DIFFERENCES IN ATHLETES AND ESPORTS PLAYERS

Dijana Ivanišević and Haris Šunje

ABSTRACT: The aim of this research is to examine the self-concept of athletes and Esports players and to determine the relationship between these possibly different self-concepts, and how they differ between athletes and Esports players.

Exactly 67 participants were involved in the research, namely 37 athletes who play sports at the highest level in Bosnia and Herzegovina, and 30 Esports players, who compete semi-professionally or professionally, at the state or regional level. The average age of the respondents was 23 years and 4 months. Sociodemographic variables were measured by the Sociodemographic Characteristics Questionnaire, which was constructed for research purposes, while the Self Discrepancy Scale was used to examine self-concept (Kolenović-Đapo and Hasanbegović, 2002).

The obtained results suggest the existence of a statistically significant difference in self-concept between athletes and Esports players, in relation to physical ($t(65)=2.72, p<0.05$), emotional ($t(65)= 2.59, p<0.05$) and social self ($t(65)= 2.66, p<0.05$). In addition, it was shown that there is no statistically significant difference between athletes and Esports players, regarding cognitive ($t(65)=1.04, p >0.05$) and moral self ($t(65)= 0.19, p>0.05$). Therefore, athletes have a more positive perception of their physical, emotional, and social self, because it is possible that in interaction with the community due to active sports participation and good performances they receive a positive and supportive reaction from the environment, which further contributes to the fact that they experience and present their physical, emotional and cognitive self in a more positive way than Esports players.

Keywords: *self-concept, athletes, Esports players, self*

INTRODUCTION

It is evident that, recently, the interest of researchers in sports and Esports has increased, as well as interest in the numerous variables that are correlated with success in the mentioned areas. However, there are not enough such studies on the Esports population, especially not in our area. Therefore, this research aims to investigate the differences in self-perception between athletes and Esports players and contribute to the spread of interest and scientific knowledge about Esports, as a modern, economically powerful industry that is becoming a dominant trend in the world of sports.

SPORTS AND ESPORTS

The availability and increased use of the Internet, technology, and computers have allowed Esports to become a global sensation. The Esports market is an economically promising market, and its viewership and popularity are increasing every day. In the US, there are even competitions for playing video games at all levels of education. In our country, playing video games is mostly still a way of using free time in a fun and interesting manner. However, there are also those who spend their time playing video games at a high level, which is partially in the domain of Esports, because there are certain disagreements among authors about the very concept of Esports. Namely, some authors believe that Esport implies only a professional level of playing video games, while recently an increasing number of authors believe that Esport also includes individuals who spend time actively playing video games at a high level (Šunje and Vardo, 2022).

Esports, in literal translation, is an electronic sport, in which one participates mainly through using computers, consoles, or mobile devices, where players

compete, individually or in teams of usually 2 to 10 people, with opponents sitting on the other side of the virtual world. The video games most associated with Esport are League of Legends, Dota 2, Overwatch, CS:GO, Paladins, Smite, Fortnite, PUBG, and Call of Duty (EsportSource, 2021).

All of these have a specific set of rules and require the development of muscle memory for the many moves to be made within the game, which requires years of hard training (Himmelstein, Liu, & Shapiro, 2017). However, some authors emphasize the benefits of traditional sports in improving social skills, as well as social and personal responsibility (Martín and González, 2005), and this creates and supports several stigmas about Esports, such as the fact that playing video games puts players at risk of favoring the pattern of impulsive, aggressive, and selfish behavior, and become aggressive, socially isolated, and lonely (Tejeiro et al., 2012).

In addition, video games have been shown to be associated with sleep problems, general fatigue, and various somatic difficulties (Choi et al., 2007; Griffiths, Davies, & Chappell, 2003; Griffiths, Davies, & Chappell, 2004), which only affirmed the mentioned stigma. However, such a trend has been fading lately, although it still carries some weight and influences the opinion that the scientific sector has about Esports and video game players. Nevertheless, there is a strong initiative among the general public for Esports to be given the title of sports in the traditional sense, and countries such as the USA, Germany, Finland, China, South Korea, South Africa, Iceland, Russia, Denmark, and Ukraine have recognized Esports as a sport, while it has had a special category at the Asian Olympic Games (Olympics, 2021) for several years already.

Also, it should be pointed out that the biggest difference between Esports and sports is actually in physical activity. However, as chess and poker

are already being classified as sports, one of the arguments of the lucrative Esport industry is that Esport deserves to be classified as a sport as well (Esportsmention, 2019). Taking into account all of the above, it would be useful for scientific and social efforts in the future to be focused on promoting the interesting and useful practice of Esports, both in the world and in our country.

Self-concept

Self-concept or self-awareness is a central concept in all theories of the self. Self-concept is defined as the totality of experiences that an individual has about himself and his identity, and includes the perception of abilities, achievements, personality characteristics, and behavior, as well as their evaluation in that context (Petz, 2005).

Therefore, it can be said that self-concept is multidimensional, composed of different characteristics, abilities, personal qualities, and roles (Fox, 2000). Thus, the self-concept is descriptive and evaluative, based on an ideal, personal standard or comparison with others because it refers to the way an individual perceives, evaluates, and values himself. The result of that process is the subjective experience of one's self, as a complete and organized mental image of oneself (Lacković-Grgin, 1994), which essentially represents a generalized experience of oneself in different areas of life and work (Kuburić, 2009). Nevertheless, the forming of the self is placed in the context of social interaction because it is ultimately a social construction (Harter, 2006).

Thus, according to the foundations of social interactionism, the basis for forming a self-concept is the feedback a person receives from significant others, and this idea of self-concept has three components, namely: the idea of how others see us, the idea of how others they evaluate what they see, and some emotion related to those performances, such as pride or humiliation, satisfaction or dissatisfaction (Krstić, 2008).

There are several models of self-concept, but one of the most dominant is the multidimensional, hierarchical model of Shavelson, Hubner, and Staton, published in 1976, according to which global self-esteem appears at the top of the hierarchy. At the next level is academic and non-academic self-concept, which is further divided. The academic self-concept is divided into subject-specific concepts, while the non-academic self-concept is divided into social, emotional, and physical self-concepts (Lacković - Grgin, 1994).

Sports and physical self-concept

The physical self has a special importance in sports participation and performance in the world of sports. Namely, it has been shown that physical constitution and the physical self play a key role in the construction of identity, and are a central component in the development of the identity of professional athletes (Loland, 1999). Accordingly, there is a strong emphasis on self-perception in the physical domain

and a tendency to derive much of the personal value from physical activity and athletic performance (Brewer, 1993).

Supporting the salience of physical self-concept in athletes, Marsh, Perry, Horsley, and Roche (1995) found that athletes had a more positive physical self-image and global self-esteem than non-athletes. They also found that among athletes of different levels, professional athletes show the most positive levels of physical self-concept and global self-esteem.

Therefore, physical constitution, stamina, and strength represent a central role in the construction of an athlete's identity (Loland, 1999), and are created and maintained around "having a young, physically fit, and functional body" (Phoenix, Faulkner, & Sparkes, 2005). However, body image, the self, and self-esteem are often influenced by both physical capacities and social perceptions related to body ideals (Stephen and Billard, 2003).

Previous research on self-concept in sports mainly shows that the physical self is positively correlated with participation in sports activities, where it serves as a motivator for participation in activities, which then in turn positively affects the physical self (Ouyang, Wang, Zhang, Peng, Song and Luo, 2020; Brudzynski and Ebben, 2010). Also, regular physical activity, the like we encounter in sports activities, positively affects the development of social self and sociability in general (Kirkcaldy, Shephard, & Siefen, 2002). Therefore, all of the above points to the need to study the differences between athletes and Esports players, in order to have as much information as possible regarding the differences between sports participants in the traditional sense of the word and participants who play video games at a high level and belong to the economically powerful Esports industry.

Also, by reviewing the literature and the results of available research, it seems that this research is the only one that investigates the mentioned topic, not only regionally, but even broader. Therefore, it seems that it is very important to answer the question of whether there is a difference in certain facets of self-concept, such as physical, emotional, social, cognitive, and moral self-concept, between athletes and esports players, which can increase scientific interest in this area and initiate new research.

GOALS AND HYPOTHESES OF THE RESEARCH

The aim of this research is to examine the self-concept of athletes and Esports players and to determine the relationship between these different self-concepts, and how they differ between athletes and Esports players. In accordance with the stated goal, the following research hypotheses were formulated:

H1. There is a statistically significant difference in the self-concept between athletes and Esports players with regard to physical, emotional, and social self, as factors of self-concept.

H2. There is no statistically significant difference in the self-concept between athletes and Esports players with regard to cognitive and moral self, as factors of self-concept.

METHOD

The research is empirical and quantitative, and the survey method was used on Esports players and athletes who are actively engaged in sports at the highest level in Bosnia and Herzegovina.

Sample

The sample of this research is represented by participants collected in different ways, through the organization "Tiltproof.gg" and the Esports Association of Bosnia and Herzegovina, as well as through cooperation with the Futsal club "Mostar SG Staklorad", RK Vogošća, KK Sloboda and FK Velež. Exactly 67 answers were collected, namely, 37 athletes who play sports at the highest level in Bosnia and Herzegovina, and 30 participants who belong to the category of Esports players, who play video games semi-professionally or professionally, at the state or regional level. Accordingly, it is assumed that this intentional sample due to the specificity of the topic and area of research, is still sufficient to achieve the research goal.

The average age of the participants was 23 years and 4 months, and the age range is 14 ± 38 . Therefore, younger examinees are also included in our sample due to the fact that esports players start participating in competitions as early as in adolescence, and quickly achieve great success.

RESEARCH PROCEDURE

The examination is of the survey type, and the surveying of participants was carried out by the examiner. After the standard instructions explaining the purpose of the research, with a note that anonymity is guaranteed, and that participation in the research is voluntary, the respondents individually proceeded to fill out the survey questionnaires.

MEASURING INSTRUMENTS

The research first collected basic socio-demographic data (age, monthly income, number of family members, and satisfaction with socioeconomic status), and for this purpose, a Questionnaire of socio-demographic characteristics was constructed.

Self-concept was assessed with the Self Discrepancy Scale (SD scale), which was constructed with the aim of examining the difference between the image that an individual has of his real self and his ideal self (SD scale, Kolenović-Đapo & Hasanbegović, 2002., according to Repišta, 2013). The scale consists of 30 self-descriptors and their opposites, and the participant's task is to evaluate how certain adjectives describe his real self on a seven-point scale. Self-descriptors with which students most often described themselves were included in the self-discrepancy assessment scale. From the potential self-descriptors (150 traits), a group of 20 evaluators had the task of classifying the self-descriptors into five different categories related to physical, emotional, social, cognitive, and moral self. According to the frequency

of assessments of terms belonging to certain categories, six terms were selected for each category, and a group of 30 adjectives was obtained to which their opposites were added.

The alpha reliability coefficient in the research conducted by Hasanbegović (2004) on a sample of high school students was $\alpha=0.79$, while this coefficient in our research is $\alpha=0.53$, which represents satisfactory reliability.

STATISTICAL ANALYSIS

The data collected in this research were processed using the program package IBM SPSS Statistics 23. Descriptive statistical measures were calculated for the self-concept variable: minimum and maximum value, arithmetic mean (M), and standard deviation (SD), while reliability measures (internal consistency) were expressed by Cronbach's alpha coefficient. In addition, the existence of differences in self-concept and the facets that determine it (physical, emotional, social, cognitive, and moral self) was examined by conducting a t-test for small independent samples.

RESULTS

According to the basic indicators of descriptive statistics for the self-concept variable from Table 1, it can be seen that the obtained results ranged from 8 to 42, with an arithmetic mean of 31.62 (physical self), 31.41 (emotional self), 30.85 (social self), and 33.47 (cognitive self) and 34.61 (moral self).

Table 1. Descriptive statistics for physical, emotional, social, cognitive, and moral self.

Self	Min	Max	M	SD	Sk.	Curt.
Physical self	12	42	31.62	6.98	-.593	-.058
Emotional self	18	42	31.41	5.53	-.375	-.246
Social self	21	41	30.85	4.58	.047	-.825
Cognitive self	15	42	33.47	5.70	-.837	.763
Moral self	8	42	34.61	7.00	-1.68	3.33

In order to answer the research hypotheses, the differences between athletes and eSports players were tested, in regard to the physical, emotional, and social self. The obtained results are presented in the following table.

Table 2. Differences in self-concept in regard to the physical, emotional and social self.

Self	Sports particip.	N	M	t	df	p
Physical self	Yes	40	33.45	2.723	65	.008
	No	27	28.92	2.997	64	.004
Emotional self	Yes	40	32.80	2.595	65	.012
	No	27	29.37	2.855	64.03	.006
Social self	Yes	40	32.02	2.666	65	.010
	No	27	29.11	2.828	64.48	.006

It has been shown that there is a statistically significant difference between athletes and Esports athletes in relation to physical ($t(65)=2.72$, $p<0.05$), emotional ($t(65)= 2.59$, $p<0.05$) and social self ($t(65)= 2.66$, $p<0.05$). Therefore, in this research, athletes achieve higher results on the components of physical, emotional and social self, compared to esportsers, and the first research hypothesis is confirmed.

In the following, in order to verify the second hypothesis of this research, we tested the differences between athletes and esports players, in regard to cognitive and moral self. The obtained results can be seen in Table 3.

Table 3. Differences in self-concept in regard to the cognitive and moral self.

Self	Sports particip.	N	M	t	df	p
Cognitive self	Yes	40	34.07	1.04	65	.300
	No	27	32.59	1.11	64.9	.267
Moral self	Yes	40	34.75	.195	65	.846
	No	27	34.40	.220	60.2	.827

From the above, it is evident that there is no statistically significant difference between athletes and Esports players in relation to cognitive ($t(65)=1.04$, $p >0.05$) and moral self ($t(65)= 0.19$, $p>0.05$). Therefore, we can conclude that the second research hypothesis is also confirmed, because athletes and Esports players do not achieve significantly different results on the components of cognitive and moral self.

DISCUSSION

In this research, we attempted to examine the differences in self-concept and certain facets of self-concept, such as physical, emotional, social, cognitive, and moral self, between athletes and Esports players. Based on the obtained results, it can be concluded that there is a statistically significant difference between athletes and Esports athletes in relation to physical self ($t(65)=2.72$, $p<0.05$), which can be supported by some earlier theoretical knowledge and research results (Loland, 1999; Brewer, 1993; Marsh, Perry, Horsley, & Roche, 1995; Phoenix, Faulkner, & Sparkes). In addition, Ouyang et al. (2020) found that the physical self is positively correlated with participation in sports activities, where it serves as a motivator for participation in those activities, and then has a returning positive effect on the physical self (Brudzynski and Ebben, 2010).

Also, there is a statistically significant difference between athletes and Esports players in relation to the emotional ($t(65)= 2.59$, $p<0.05$) and social self ($t(65)= 2.66$, $p<0.05$), which is in accordance with the research conducted in our region, according to which athletes show statistically significantly lower levels of neuroticism, and higher levels of extraversion than Esports players (Šunje and Vardo, 2022). Namely, athletes experience less unpleasant and disturbing emotions and have a lower tendency towards

agitation in thoughts and actions. On the other hand, they are characterized by greater emotional stability and calmness compared to Esports players, and in this research, it was shown that they also have a more positive perception of the emotional self.

In addition, athletes prefer large gatherings and show a greater desire and need to establish relationships with a larger number of people and receive greater social attention than Esports players, and it was shown that they also have a more positive perception of the social self. This is supported by the research conducted by Kirkcaldy, Shephard, and Siefen (2002) who found that regular physical activity has a positive effect on the development of social self and sociability. Thus, the first research hypothesis was confirmed.

The obtained results also indicate that there is no statistically significant difference between athletes and Esports players, in relation to cognitive ($t(65)=1.04$, $p >0.05$) and moral self ($t(65)= 0.19$, $p>0.05$), which is expected. Namely, the skillful performance of athletes and Esports players, which we admire and enjoy watching, would not be possible without dedicated practice and extensive training. As a result of involvement in regular training and preparation, both athletes and Esports players gain certain cognitive skills (Glavaš, 2017). Some of them are fundamental, and some are more specific, but both athletes and esports players are equally aware that they are necessary for their success, and they work with additional dedication on improving them (working memory capacity, conscious control of attention, etc.), in order to achieve the best possible results in their field. Therefore, in this research, it was shown that there is no significant difference between these two groups, in regard to cognitive self.

In addition, playing sports and esports, which is a specific type of sport, includes the expression of moral values and moral behavior, which gradually shape the moral consciousness of the athlete, as well as the presence of general morality (fair play), which implies the development of correct relations between sports rivals, respect for the rules and decisions, as well as harmonizing personal needs and interests with the needs and interests of the team (Bajraktarević, 2008). In accordance with this, the obtained results show that there is no statistically significant difference between athletes and Esports players, in regard to their moral self, which is why the second hypothesis of this research is also confirmed.

Therefore, athletes have a more positive perception of their physical, emotional, and social self, because it is possible that in the interaction with the audience, the coach, and each other, they receive a positive and supportive reaction from the environment. Therefore, athletes experience their physical, emotional, and social self and present it to their community in a more positive way than esports players, who participate in sports by playing video games via computers, consoles, or mobile devices, which is why they are somewhat isolated and at the risk of being lonely, without having too many opportunities for real social interaction and genuine interpersonal communication in that virtual world.

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THE EFFECTS OF THE APPLICATION OF THE WORK TRAINING PROGRAM ON THE TRANSFORMATION OF THE MOTOR SKILLS OF YOUNG BASKETBALL GIRLS AGES 13 TO 15

Mile Galić, Azer Korjenić and Ante Vučić

ABSTRACT: Researching the impact of the training program on the structure and relationship of latent anthropological dimensions, as well as the progress of the overall situational performance, i.e. efficiency in basketball, could contribute to an easier understanding of the overall basketball game of young female basketball players. As opposed to that, well-designed and programmed training can effectively contribute to the desirable direction of growth and development of young basketball players.

The main goal of this research was to determine the level and magnitude of changes in motor skills of young basketball players aged 13 to 15 under the influence of the applied basketball training program. The goal of the factor analysis in this research was not only to determine the latent structure of the researched areas, but also to primarily establish the presence of qualitative changes that were created by the implementation of the training program process in basketball.

KEYWORDS: *basketball, transformations, training program, motor skills*

INTRODUCION

It can be concluded that it is necessary to research how and to what extent a certain program fulfills the assumptions, and whether it is possible to influence the abilities and improvement of the basketball game itself.

The need for research related to this topic, especially refers to the transformation of the morphological characteristics of female basketball players aged 13 to 15, under the influence of the applied training program.

It was necessary to research, discover and obtain significant information that can greatly improve the training process of basketball players, and therefore have a positive effect on their overall anthropological status.

Therefore, basketball, as an integral part of the broad field of physical education and sports, undoubtedly represents at the same time a means for energy-motor and intellectual activity. From the point of view of the movement and structure of the situation in the game, basketball is one of the most complex team games dominated by rapid transformations from action to action, which inevitably leads to transformations in the anthropological status of the participants of the basketball game.

METHOD OF WORK

In the methodological development of this research, an overview of the definition of the sample of respondents, instruments, i.e. battery of tests that were used to analyze the researched anthropological spaces, as well as a description of their technical performance, then a brief description of the research, methods of statistical data processing, and the time frame of the research is presented.

Sample of respondents

The population from which the entity sample was taken for this research was defined as a sample of young female basketball players aged 13 to 15, who actively play and train in the ŽKK "Ljubuški" from Ljubuški. 88 girls - players, who train at the basketball school ŽKK "Ljubuški" from Ljubuški - were included in this research. There were no special restrictions regarding the validity of the sample, except that the girls included in this sample at the time of testing and measurement, as well as the implementation of the training work, had to be healthy and had to complete the planned training program.

Sample of variables

12 variables were used to assess motor skills.

MESSAR - Sargent's test, MESSDM - standing long jump, MESBML - throwing a medicine ball from a lying position, MAGTUP - envelope test, MAOKTL - agility on the ground, MAGKUS - lateral steps, MFISKP - stick mobility, MFIUPS - seated forward bend, MFBOŠP - lateral twine, MRSSKL - push-ups, MRSDDL - body lifting from lying down, MRSDTZ - body lifting from a cover.

RESULTS AND DISCUSSION

The characteristics and size of the selected sample of respondents determined the basic methods for processing the data that were obtained through this research, using software packages for multivariate data analysis.

Factor analysis was used to analyze qualitative changes under the influence of the applied basketball training program, with the aim of investigating the latent structure of the researched areas as well as defining the structure of the applied variables.

Quantitative changes within the researched anthropological spaces were determined with the help of discriminative canonical analysis.

Analysis of qualitative changes in the investigated motor abilities

The results of the analysis of qualitative changes in 12 motor variables, on a sample of 88 female basketball players, aged 13 to 15, were performed by factor analysis - the congruency method. The possibility of subjecting this set of motor variables to any type of factorization was also first tested using Bartlett's test.

The data from Table 1 (initial and final measurement) confirmed to us that the data can be subjected to factorization (Sig ,000).

Using the congruence method - matching the factor scores of the initial and final measurements, we wanted to determine whether there were structural changes in the investigated motor area, under the influence of the applied basketball training program.

Table 1. Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		INITIAL	FINAL
		.569	.607
Bartlett's Test of Sphericity	Approx. Chi-Square	621.083	714.015
	Df	87	87
	Sig.	.000	.000

Table 2 shows the characteristic roots and explained parts of the variance of the initial and final measurement of the variables for assessing the motor abilities of the investigated sample of female basketball players aged 13 to 15 years.

As can be seen from the initial measurement (table 2), six latent dimensions were isolated that explain the total manifest space with 60.02% of the common variance. The individual contribution to the explanation of the common variance is for the first main component 19.11%, for the second 14.29%, for the third 7.65%, for the fourth 7.20%, for the fifth isolated component 6.22% and for the sixth isolated component 5.56 % of the common variability. By analyzing the obtained values of the results of the qualitative analysis of the researched motor space, we can state that six latent dimensions were also isolated in the final measurement, which explains the total investigated manifest motor space with 61.71% of the common variability. By looking at the results of the individual contribution to the explanation of the common variability, we can say that the same for the first main component is 19.35%, for the second 13.70%, for the third 9.52%, for the fourth 7.36%, for the fifth 6.15% and for the sixth isolated component 5.64% of the common variability.

Looking at table 3 (the matrix of the set of isolated factors of the motor space at the initial measurement), it is evident that the largest part of the explanation of the variance is exhausted by the first main

component, which can be defined as a power factor, with the dominance of explosive power because the variables have the highest projections on it: throwing a medicine ball from lying down (MESBML), Sargent's test (MESSAR), push-ups (MRSSKL) and standing long jump (MESSDM).

On the second main component, significant projections have the variables: lateral twine (MFBOŠP) and agility on the ground (MAOKTL). We can define this main component as a mixed factor of flexibility and coordination.

On the third main component, the most significant projection, have the variables: seated forward bend (MFIUPS), stick mobility (MFISKP) and lateral twine (MFBOŠP), and we can define this main component as a pure flexibility factor.

On the fourth main component, the variables lateral steps (MAGKUS) and agility on the ground (MAOKTL) have significant projections. This isolated main component can be defined as a pure coordination factor.

On the fifth main component, which is isolated from the residual variability of all applied variables for the assessment of motor abilities, significant projections have the variables body lifting from a cover (MRSDTZ) and body lifting from lying down (MRSDTL). This isolated main component can be defined as a pure factor of repetitive strength.

The variable: the envelope test (MAGTUP) has a significant projection on the sixth main component, which is isolated from the residual variability of all applied variables for the assessment of motor skills. This isolated main component can be defined as a pure coordination factor. Analyzing Table 3 (the matrix of the set of isolated factors of the motor space at the final measurement), it is also evident that the largest part of the explanation of the common variability is exhausted by the first main component, which can be defined as a pure strength factor, because the variables have the largest projections on it: MESBML - throwing a medicine ball from lying down, standing long jump (MESSDM), push-ups (MRSSKL), and the Sargent test (MESSAR).

On the second main component, significant projections have the variables: (MFISKP) stick mobility and (MFIUPS) seated forward bend. This main component can be defined as a mixed factor of flexibility and repetitive strength.

On the third main component, the most significant projection, has the variables: stick mobility (MFISKP) and lateral twine (MFBOŠP), and the same main component can be defined as a pure flexibility factor.

On the fourth principal component, significant projections have the variable lateral steps throwing a medicine ball from a lying position (MESBML). This isolated main component can be defined as a pure factor of explosive strength of the upper body muscles and shoulder girdle.

On the fifth main component, which is isolated from the residual variability of all applied variables for the assessment of motor abilities, significant projections have the variables lateral steps (MAGKUS) and floor

coordination (MAOKTL). This isolated main component can be defined as a pure coordination factor.

On the sixth main component, which is isolated from the residual variability of all applied variables for the assessment of motor abilities in the final test, significant projections have the variables: body lifting from cover (MRSDTZ) and body lifting from lying down (MRSDTL). This isolated main component can be defined as a pure repetitive strength factor.

Looking at the obtained results within the component correlation matrix of the investigated motor variables (initial measurement, table 4), we see that a statistically significant correlation coefficient was achieved between FAK-6 (which is defined as a mixed factor of segmental speed and repetitive strength) and FAK-1 (which is defined as a mixed factor of coordination and strength), and the achieved correlation coefficient is .209. This connection has its own logical sequence, because the isolated factors are mutually conditioned and are in direct mutual correlation. By looking at the results obtained within

the component correlation matrix of the researched motor variables at the final measurement (table 4), we can see that a statistically significant correlation coefficient was achieved between FAK-4 (which is defined as a pure factor of the explosive strength of the muscles of the upper extremities and shoulder girdle) and FAK-1 (which is defined as a mixed factor of coordination and strength), and that the value of the achieved correlation coefficient is .207.

A statistically significant correlation coefficient was also achieved between FAK-6 (which is defined as a mixed factor of segmental speed and repetitive strength) and FAK-1 (which is defined as a mixed factor of coordination and strength), and that the value of the achieved correlation coefficient is .215.

Also, between FAK-6 and FAK-4, a statistically significant correlation coefficient was achieved, and it amounts to .204. This kind of connection has its own logical sequence, because the motor abilities expressed by dominance within the isolated factors are mutually conditioned and directly dependent.

Table 2. Isolated main components of motor abilities

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			INITIAL
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	3.631	19.111	19.111	3.631	19.111	19.111	
2	2.715	14.288	33.399	2.715	14.288	33.399	
3	1.453	7.650	41.049	1.453	7.650	41.049	
4	1.368	7.199	48.248	1.368	7.199	48.248	
5	1.182	6.218	54.466	1.182	6.218	54.466	
6	1.056	5.559	60.025	1.056	5.559	60.025	
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			FINAL
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	3.676	19.349	19.349	3.676	19.349	19.349	
2	2.602	13.696	33.045	2.602	13.696	33.045	
3	1.809	9.522	42.567	1.809	9.522	42.567	
4	1.398	7.359	49.926	1.398	7.359	49.926	
5	1.169	6.153	56.079	1.169	6.153	56.079	
6	1.071	5.637	61.715	1.071	5.637	61.715	

Table 3. Matrix of the set of isolated of motor abilities

Variable	INICIJALNO						FINALNO					
	Component						Component					
	1	2	3	4	5	6	1	2	3	4	5	6
MESSAR	.594	.023	-.015	-.257	.074	.088	.510	-.042	.030	.400	-.063	.000
MESSDM	.483	-.107	.078	-.149	-.180	.335	.640	-.267	.015	.256	.148	.044
MESBML	.839	.033	-.081	.119	.142	-.033	.564	.089	-.109	.888	-.038	.027
MAGTUP	-.081	.240	.143	.141	.137	-.683	-.250	-.281	.201	.148	.029	-.031
MAOKTL	.022	.266	-.113	.611	-.069	-.132	-.312	.164	-.011	.274	.407	-.159
MAGKUS	.008	-.179	-.019	.757	-.072	-.007	-.041	-.078	-.091	-.110	.884	.061
MFISKP	.281	-.167	-.536	-.097	-.159	-.290	.226	-.520	-.671	.113	.106	-.208
MFIUPS	.044	-.179	.928	-.211	-.070	-.209	.051	-.434	.234	-.067	-.056	-.156
MFBOŠP	.265	.382	.467	.238	-.030	.127	.064	.195	.463	.236	.376	.194
MRSSKL	.514	.136	-.034	-.322	-.102	.131	.541	.152	.206	.263	-.143	.000
MRSDTL	.384	-.121	.098	-.007	.655	-.023	-.016	-.223	.154	.339	-.138	.412
MRSDTZ	.057	.017	-.106	-.471	.671	-.028	.028	.009	-.100	.150	-.231	.583

Table 4. Intercorrelation matrix of isolated factors

Component	1	2	3	4	5	6	INITIAL
1	1.000	-.043	.077	-.176	.081	.209	
2	-.043	1.000	.119	.111	.014	.088	
3	.077	.119	1.000	.066	.076	.164	
4	-.176	.111	.066	1.000	-.010	-.116	
5	.081	.014	.076	-.010	1.000	.038	
6	.209	.088	.164	-.116	.038	1.000	
Component	1	2	3	4	5	6	FINAL
1	1.000	-.057	-.014	.207	-.095	.215	
2	-.057	1.000	.051	-.011	.093	.033	
3	-.014	.051	1.000	.157	.107	.111	
4	.207	-.011	.157	1.000	.021	.204	
5	-.095	.093	.107	.021	1.000	-.101	
6	.215	.033	.111	.204	-.101	1.000	

CONCLUSION

The goal of the factor analysis in this research was not only to determine the latent structure of the researched spaces, but also to establish primarily the presence of qualitative changes that were caused by the implementation of the training program process in basketball.

Using the congruence method - matching the factor scores of the initial and final measurements, it was determined that structural changes occurred as a product of the applied planned and programmed training process lasting 90 days.

Analyzing the results of the qualitative analysis of the space of the investigated motor variables, we can conclude that under the influence of the applied basketball training program, there were transformational changes in the structure of the investigated motor space of female basketball players aged 13 to 15 years.

The results of the factor analysis provide the basis that in the basic structure of motor skills after the implementation of the work training program, there were significant qualitative changes in this research.

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EFFECTS OF A THREE-MONTH PROGRAM ON SWIMMING SPEED USING THE BREASTSTROKE TECHNIQUE

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ABSTRACT: The main goal of the research is to determine the effects of the three-month program on breaststroke swimming speed. Swimming offers a variety of physical benefits for most people. For example, it strengthens large muscle groups throughout the body, including the heart. Swimming on a regular basis reduces the risk of cardiovascular diseases, diabetes, and cancer. It is widely known that swimming is a great way to positively improve mood in men and women; it can be used to reduce anxiety and depression as well. Swimming is an activity that requires the body to be in a lying, horizontal position, which relieves the spine of stress. Water provides up to 14% more resistance, which prevents making sudden movements, which ultimately leads to a reduction in injuries, and at the same time encourages strength building. All movements are efficient during swimming, and they evenly place stress on the body to improve strength and muscle building. The sample consisted of males, aged 10-12 years, of the Association of Sports and Health "Sportivo" Sarajevo. The sample of respondents for this research was represented by 44 swimmers, clinically and psychologically healthy and without significant morphological and locomotor impairments. The research was conducted at the regular training sessions of the Sports and Health Association "Sportivo" Sarajevo at the Otoka Olympic Pool, Sarajevo. The choice of variables for this research was made based on their measurement characteristics: validity, reliability, sensitivity, economy and adaptability, and appropriateness to the age of the respondents. To evaluate the speed parameters of breaststroke swimming: Swimming speed at 25m breaststroke technique – BPPT25, Swimming speed at 50m breaststroke technique - BPPT50, and Swimming speed at 100m breaststroke technique – BPPT100. It is worth noting that boys at this age consider the breaststroke technique to be a female technique, and therefore the swimming is much slower as they could not prove their superiority and competitiveness, so they did not give their best performance during the implementation of the program. In this case, the professional should include the psychological preparation of the swimmers in order to get a more efficient result in the program. The results showed that the content of the program had a positive effect on the set variables, but also showed its shortcomings, which should be included in the next project.

Keywords: *Swimming, breaststroke, effects*

INTRODUCION

Not knowing how to swim and not having a swimming pool is not, and must not be an excuse or a "sports" and local problem, instead, it is a global problem, a problem of health, hygiene, safety, education, and culture (Gošnik, J. and Sedar, M. 2010). Swimming is an important factor in the formation of posture and the formation of healthy habits in children. When talking about sports or competitive swimming, it can be said that swimming belongs to the series of cyclical sports in which, according to the form and method of execution, relatively simple movements dominate, which are always the same and are repeated alternately during swimming of a certain technique (Madić, Okičić & Aleksandrović, 2007). Swimming offers a variety of physical benefits for most people. For example, it strengthens large muscle groups throughout the body, including the heart. Swimming on a regular basis reduces the risk of cardiovascular diseases, diabetes, and cancer. It is widely known that swimming is a great way to positively improve mood in men and women; it can be used to reduce anxiety and depression as well. Swimming is an activity that requires the body to be in a lying, horizontal position, which relieves the spine of stress. Water provides up to 14% more resistance, which prevents making sudden movements, which ultimately leads to a reduction in injuries, and at the same time encourages strength building. All movements are efficient during swimming,

and they evenly place stress on the body to improve strength and muscle building. As for aerobic and anaerobic respiration, research has shown that middle-aged men and women improve aerobic and anaerobic respiration by swimming, and it increased by 10% in a period of 12 weeks. The amount of blood pumped by the heart also increased, by 18%. Swimming is an optimal sport for children with asthma, which is supported by the fact that children with asthma won five gold medals in Swimming at the Olympics (1956-1972) (Trivun, M., Tošić, J. and Marković, V. 2013). It should be emphasized that swimming burns a large number of calories, from 500 to 650, depending on the intensity of swimming. In addition to strengthening the pectoral muscles, one hour of breaststroke swimming can burn up to 750 calories, 30 minutes of front crawl burns around 350 calories, one hour of butterfly (dolphin) burns around 800 calories, while backstroke burns around 500 calories per hour (Trivun, M., et al. 2013). Swimming has great and irreplaceable importance in the development of a child, which is manifested in the morphological, functional, psychological, biomotor, and intellectual development of young children (Tošić, S. 2010). Wolfrum, M., Rust, C.A., Rosemann, T., Lepers, R., and Knechtle, B. (2014). This research aimed to analyze potential changes in the performance of elite breaststroke swimmers who compete at the national and international levels and to compare it with the performance of freestyle swimming. Swimming speed

in both cases significantly improved ($p < 0.0001-0.025$) over time for both genders, except for the 50m breaststroke for FINA men. Gender differences in swimming speed increased significantly over time for Swiss freestyle swimmers ($p < 0.0001$) but not for FINA freestyle swimmers, while the gender difference remained stable in Swiss and FINA breaststroke swimmers. Gender differences in swimming speed significantly decreased ($p < 0.0001$) with increasing race length. The main goal of the research is to determine the effects of the three-month program on breaststroke swimming speed.

RESEARCH METHODS

A sample of respondents

The sample consisted of males, aged 10-12 years, of the Association of Sports and Health "Sportivo" Sarajevo. The sample of respondents for this research was represented by 44 swimmers, clinically and psychologically healthy and without significant morphological and locomotor impairments. The research was conducted at the regular training sessions of the Sports and Health Association "Sportivo" Sarajevo at the Otoka Olympic Pool, Sarajevo.

Sample variables

The choice of variables for this research was made based on their measurement characteristics: validity, reliability, sensitivity, economy and adaptability, and appropriateness to the age of the respondents according to Mirvić, E., (2011). To evaluate the speed parameters of breaststroke swimming: Swimming speed at 25m breaststroke technique – BPPT25, Swimming speed at 50m breaststroke technique - BPPT50, and Swimming speed at 100m breaststroke technique – BPPT100.

Process

To ensure the regularity of this research, consents from the following institutions and individuals were used during the planning stages of the process: Assistance from experts in the field of sports and physical education (verified trainers) in the realization of the project; The decision of the Sports and Health Association "Sportivo" Sarajevo that this project can be tested and implemented as part of the regular training of the club of the same name; Approval and confirmation that testing was done at the Otoka Olympic Pool, Sarajevo; All subjects had the same conditions during measurement and testing (the entire research was carried out in the morning hours, between 8 to 9:30 a.m., the temperature was between 24 to 26 degrees Celsius, the place of testing was the Otoka Olympic pool, Sarajevo; equipped with all necessary equipment); Before the measurement and testing process, the swimmers of the Sports and Health Association "Sportivo" were briefed in and the project was explained in an acceptable way of what awaits them during the period of the research

implementation, and what is required of them in their work; The measurement was performed in 4 groups of 11 swimmers; A Measurer and Recorder worked at each measuring point; The team of measurers consisted of professors/masters of sports and physical education and coaches of swimming clubs who were familiar with the research project, measurement lists and how to fill them in; The swimmers of the Sports and Health Association "Sportivo" were divided into four groups, each group implemented a program with a different order of sports technique training for a period of 3 months. Initial testing will be done, then a three-month program will be implemented, and lastly, final testing will be done.

Data processing methods

In the process of data processing, based on the characteristics and size of the sample, the subject, the problem, and the goal of the research, statistical methods were determined for obtaining results in the research. Using descriptive statistical methods from the SPSS 12.0 program, we will determine the basic parameters that characterize the sample: Min., minimum value, Max., maximum value, Range, Sum., summary, Median, median, Mean, arithmetic mean, Std. Dev., standard deviation, Error, standard error, Variance, coefficient of variation. The normality of the distribution of variables will be examined based on the coefficient: Skewness, curvature, Kurtosis, and elongation coefficient. Differences will be determined by the T-test for dependent samples.

RESULTS

Central and dispersive parameters of variables for evaluating the speed of breaststroke swimming in the initial state.

Looking at table number 1, descriptive statistical methods were used to process the data, where it can be observed that in all variables there is no significant deviation from the normal distribution. The distributions of the subjects' abilities fit into the standards specified for the speed of breaststroke swimming of boys aged 10 to 12 years, even though this population is in the process of constant transformation, which is the result of the influence of the specific age of the subjects. Therefore, there are no significant deviations in the distribution of results from the normal distribution for certain swimming techniques, which we can see from the table shown, where our current situation can generally be determined. By individual review and analysis of the variables, we can determine the following: Speed of swimming with the breaststroke technique at 25 meters - BPPT25 - the arithmetic mean is (MEAN is 28.0893), the range (MIN. - MAX.) is from 22.22 to 42.30 and the standard deviation (STD. DEV.) 6.62724. The speed of swimming with the breaststroke technique at 50 meters - BPPT50 - the arithmetic mean is (MEAN is 54.3289), the range (MIN. - MAX.) is from 44.66 to 69.80 and the standard deviation (STD. DEV.) is 6.06079. 100-meter breaststroke swimming speed - BPPT100 - arithmetic

mean (MEAN is 109.0423), range (MIN. - MAX.) which is from 99.24 to 132.84 and standard deviation (STD.

DEV.) 9.44927. By looking at table no. 1 it can be determined that a normal distribution has occurred.

Table 1. Central and dispersive parameters for the swimming program efficiency on the speed of swimming with the breaststroke technique in the initial state

Descriptive Statistics												
Variables	N	Range	Min	Max	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BPPT25	44	20.08	22.22	42.30	28.089	.99909	6.62724	43.920	1.298	.357	.070	.702
BPPT50	44	25.14	44.66	69.80	54.328	.91370	6.06079	36.733	.365	.357	.085	.702
BPPT100	44	33.60	99.24	132.84	109.042	1.42453	9.44927	89.289	.923	.357	.134	.702
Valid N (listwise)	44											

Central and dispersive parameters of the variables for evaluating the speed of swimming with the breaststroke technique in the final state.

Reviewing table no. 2, it can be seen that in the final measurement used in this research, it can be concluded that there is no significant deviation from the normal ranges. The distributions of the respondents' abilities fit the standards specific to the specified area. So, there are no significant deviations in the distribution of the results from the normal ranges for the individual mentioned variables. We can see this from the presented table, where the current situation can generally be determined. Individual examination and

analysis of the variables can determine the following: Speed of swimming with the breaststroke technique at 25 meters - BPPT25 - the arithmetic mean is (MEAN is 25.1575), the range (MIN. - MAX.) is from 79.50 to 30.89 and the standard deviation (STD. DEV.) 2.50345, Swimming speed with breaststroke technique at 50 meters - BPPT50 - the arithmetic mean is (MEAN is 53.4948), the range (MIN. - MAX.) is from 41.88 to 68.10 and the standard deviation (STD. DEV.) 6.52877, Swimming speed breaststroke technique at 100 meters - BPPT100 - the arithmetic mean is (MEAN is 106.5282), the range (MIN. - MAX.) is from 96.03 to 131.11 and the standard deviation (STD. DEV.) is 8.78444

Table 2. Central and dispersive parameters for the swimming program efficiency on the speed of swimming with the breaststroke technique in the final state

Descriptive Statistics												
Variables	N	Range	Min	Max	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BPPT25	44	11.39	19.50	30.89	25.157	.37741	2.50345	6.267	.960	.357	1.178	.702
BPPT50	44	26.22	41.88	68.10	53.494	.98425	6.52877	42.625	.199	.357	-.309	.702
BPPT100	44	35.08	96.03	131.11	106.528	1.32430	8.78444	77.166	1.478	.357	1.921	.702
Valid N (listwise)	44											

Based on table no. 1 and table no. 2, it can be noted that the results experienced a transformation, and which specific results and how much the transformation took place will be determined in the following methods. It can be stated that the results showed mostly centroid grouping, and the results can be taken into further consideration.

Analysis of the results of the T-test of the initial and final stage of the effectiveness of the program on the speed of the breaststroke swimming technique

T-test analysis (Table 3.) for dependent samples, the effects of the program on the speed of breaststroke

swimming were evaluated. The results indicate positive and statistically significant differences in the majority of variables in the transformation of the speed of swimming with the breaststroke technique. Statistically significant differences between the initial and final testing were found in the BPPT25 - BPPT25F tests $t(43) = 2.778$, $p = .008$. The average decrease in value in this test was 2.386, while the 95-percent confidence interval extends from .653 to 4.118, $\eta^2 = 0.11$. No significant differences were found in the BPPT50 - BPPT50F tests $t(43) = 2.375$, $p = .022$. The average decrease in value in this test was .834, while the 95-percent confidence interval extends from .125 to 1.542, $\eta^2 = .10$. Statistically significant differences between the initial and final testing were not found in the BPPT100 - BPPT100F

tests $t(43) = 2.981$, $p = .005$. The average decrease in value in this test was 2.514, while the 95-percent

confidence interval extends from .813 to 4.214, $\eta^2 = 0.12$.

Table 3. Results of the T-test of the initial and final stages of swimming speed with the breaststroke technique

Variables	Paired Differences					t	Df	Sig. (2-tailed)	η^2
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1 BPPT25 - BPPT25F	2.386	5.698	.85911	.65380	4.118	2.778	43	.008	0,11
Pair 2 BPPT50 - BPPT50F	.834	2.329	.35114	.12595	1.542	2.375	43	.022	0,10
Pair 3 BPPT100 - BPPT100F	2.514	5.593	.84329	.81343	4.214	2.981	43	.005	0,12

DISCUSSION

The main objective of this study was to determine the effects of the three-month program on breaststroke swimming speed. According to the research conducted by (Okčić, Jorgić, Madić, Thanopoulos and Jovanović, 2012), the entire set of specifically applied motor variables has a statistically significant relationship with the result of swimming in the 100 m breaststroke. The obtained results indicate the need to learn and improve the breaststroke technique and develop all parameters of specific motor skills in young swimmers. It also indicates that in the training process with younger categories, optimal conditions should be created for the development of all motor skills that can have an impact on swimming efficiency in breaststroke technique. Marinho, A.D., Amorimi, R.A., Costa, A.M., Marquesi, M.C., Perez-Turpin, J.A. and Neiva, H.P. (2011). This research aimed to analyze AnCV in young swimmers, comparing the anaerobic indicator with the best swimming performances in short sections (50, 100, and 200 m). The results showed a strong relationship between AnCV and swimming performance in 50 and 100 m backstroke, breaststroke, and front crawl; and between AnCV and swimming performance in 200 m breaststroke and front crawl. In addition, no differences were found between 200 m speed and AnCV in all swimming techniques. Abe, D., Tokumaru, H., Niihata, S., Muraki, S., Fukuoka, Y., Usui, S. and Yoshida, T. (2006). They investigated high swimming speeds, the relationship between speed (v) and sustainable pace (T) can be described by a hyperbolic relationship: $(v - V_{crit}) \cdot t = D'$, where V_{crit} is called the critical speed and D' is defined as the curvature constant hyperbolic curves. This study aimed to examine whether V_{crit} can be applied to evaluate short-distance breaststroke performance and to assess the relative contribution of D' in short-distance swimming performance. Cluster analysis showed that most subjects were classified as V_{crit} dependent when swimming 50 m. These results significantly influenced how it could be applied to evaluate short-term and long-distance swimming performance, and it determines about 80% of short-distance breaststroke swimming performance. Knowing the changes in the relationships of breaststroke parameters, when swimming different sections, is useful data for coaches and their swimmers (Sidney, Alberty, Leblanc & Chollet, 2011). According to Takagi, Sugimoto, Nishijima & Wilson (2004), better swimmers have a longer gliding phase and tend to lose

as little speed as possible during the retro pulse phase in breaststroke, which was determined by analyzing different breaststroke disciplines in the 2001 World Swimming Championships. Šiljeg, Leko and Mikulić (2011).

Pešić, M., et al. (2013). in their research determined the effects of a one-year training process on changes in the parameters of specific motor skills in the discipline of 100 meters breaststroke in young swimmers. They concluded that the applied training program lasting one year can be concluded to have achieved positive results in terms of improving the results of swimming in the 100-meter breaststroke, as well as improving all parameters of specific motor skills that affect that result. Given that the start time (VS), turn time (VO) and absolute swimming speed (V_{10}) takes place in the anaerobic work mode, we can say that the applied training program had a positive impact on the energy system, that is, on the anaerobic endurance of young swimmers, as well as on the strength of the leg muscles, which play a significant role in the reflection phase at the start and each turn. The following training process should be modified in terms of rationality, in order to achieve even greater training effects for the same or a shorter period. Dimitrić, G., et al. (2013). This paper aims to determine the individual influence of swimming techniques on the result in the 200-meter medley, using the times of the first 30 male and female swimmers who participated in the European championship in small pools (25 m) in Poland in 2011. The conclusion was made that in the male and female competition, swimming with the breaststroke technique has the greatest influence on the final result, i.e. the swimmer's rank. However, it must be taken into account that this research is about children aged 10-12 who are in biological development and are not professional competitors. In this period, the children have not perfected the complete breaststroke technique, where certain details must be pointed out and corrected when performing the technique. The training itself should lead to better results, which can be proven in subsequent research. The results are good indicators for coaches and experts in breaststroke technique to modify and adapt the new training regimen for breaststroke technique. It can be concluded that the program had a positive impact, but it is evident that better results can be achieved with certain program changes.

CONCLUSION

The goal of the research was to determine the effects of a three-month program on the speed of breaststroke swimming. Three tests were applied that evaluated the speed of swimming with the breaststroke technique. By looking at the descriptive statistics, it can be concluded that the values of the arithmetic means of the initial and final tests are in a normal distribution, and can go even further. By analyzing the results of the T-test for dependent samples, it can be concluded: the obtained results indicate to water polo experts that continuous work on technique improvement is of great importance for the speed of breaststroke swimming. By bringing together all biomechanical principles, the resistance in the water is reduced and thus the speed of swimming with the breaststroke technique is increased. It is worth noting that boys at this age consider the breaststroke technique to be a female technique, and therefore the swimming is much slower as they could not prove their superiority and competitiveness, so they did not give their best performance during the implementation of the program. In this case, the professional should include the psychological preparation of the swimmers in order to get a more efficient result in the program. The results showed that the content of the program had a positive effect on the set variables, but also showed its shortcomings, which should be included in the next project.

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CORRELATION OF LATENT DIMENSIONS OF FUNCTIONAL MANAGERS IN SPORTS ASSOCIATIONS IN THE COUNTY OF WEST HERZEGOVINA

Dženan Šuta, Damir Đedović and Adi Palić

ABSTRACT: This research has the character of a transversal study with the aim of analyzing and determining the correlations of the latent dimensions of respondents who perform the functions of functional managers in sports associations from the area of the West Herzegovina County. As mid-level managers in sports organizations, they represent the link between top and operational management and as such perform perhaps the most sensitive part of the work within the organizations. The results of this research showed that 12 isolated factors were extracted using the method of principal components for functional managers, which exhaust 84.3% of the common valid variance. Orthogonal projections of vectors of manifest variables onto vectors of latent dimensions are presented in the structure matrix. Analyzing the structure of the variables, we see that twelve isolated factors were singled out, each of which in its own way explains and hypothetically covers certain areas that are interesting for this research. It can be seen that all twelve isolated factors are dominated by variables and answers that hypothetically cover the work space and mid-level management competencies, and that the main focus of the respondents is on the competencies of functional managers, i.e. the mid-level management of the organization they belong to. In some isolated factors, one can also notice a focus on top management jobs, which is to some extent expected considering the job description of respondents who are part of functional management.

Keywords: *functional managers, sports clubs, factors*

INTRODUCTION

The middle level of managers, or functional management, represents the connection between top managers and first line managers. They are most often the heads of individual organizational units or business functions, so very often this type of manager is also called functional manager. Their number and structure depend on the size, type of activity and existing standards of the organization. The nature of functional management is such that the managers of the main organizational departments, such as: Marketing, production, finance, procurement, research, are responsible. Functional management, which represents the middle level of a managerial position in sports, has gained a new quality, which is the ability to make decisions and manage the work for which it is in charge much more independently. and development of managerial skills. Functional managers are responsible for the functionality of the sports organization. At this management level, self-marketing, human resource management, and development and research are organized. The three key competences of functional management for acquiring sustainable and fundamental competitive advantages, which relate to responsibility towards the user, are efficiency, quality, innovation. Functional management is primarily responsible for creating functional strategies of certain functional areas of the sports organization, which represent input information for the business strategy, for which strategic management is responsible. Functional managers must have a crystal clear vision of strategic management, which should be a precise guide in the implementation of the strategic plan. Functional managers cover the management of jobs, processes and organizational structures, i.e. exclusively one part of a sports organization, eg marketing, finance, facilities, administration, accounting, etc.

SUBJECT AND OBJECTIVE OF THE RESEARCH

The subject of this research is the analysis of the latent dimensions of functional managers in sports associations in the area of West Herzegovina County. The aim of this research is to determine the structure of the researched area of functional managers in sports associations in the area of West Herzegovina County.

METHODS

The internal and external organization of sports associations from the area of West Herzegovina County was analyzed on a sample of 41 respondents. Respondents who were part of this research work as functional managers within their organizations. In accordance with the problem of the research, a systematic methodical-methodological approach was realized, using appropriate logical, mathematical, statistical methods and procedures at the univariate and multivariate level. For the purposes of this work, analyzes were applied that included elementary statistical parameters and factor analysis.

RESULTS AND DISCUSSION

On a sample of 41 respondents, the internal and external organization of sports organizations from the area of West Herzegovina County was analyzed by functional management. Using the method of principal components for functional managers, 12 isolated factors were extracted, which exhaust 84.3% of the common valid variance (table 1). The first factor exhausts the most information about the applied system of variables, 16.8%, the second factor exhausts 13.4%, the third factor exhausts 10.3%,

while the others exhaust a smaller percentage of information. The fourth factor consumes 7.9%, the fifth 7.0%, the sixth 6.2%, the seventh 5.5, the eighth

4.4, the ninth 3.8, the tenth 3.3, the eleventh 2.6, the twelfth 2.5 of the total variances.

Table 1. Factor analysis in the space of the internal organization of sports associations of functional managers

Total Variance Explained				
Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total
1	7.227	16.807	16.807	5.185
2	5.766	13.409	30.216	4.851
3	4.466	10.385	40.602	3.146
4	3.420	7.954	48.556	2.742
5	3.053	7.099	55.654	3.824
6	2.690	6.256	61.911	2.783
7	2.395	5.570	67.481	2.488
8	1.920	4.466	71.947	3.616
9	1.643	3.820	75.767	4.106
10	1.443	3.357	79.124	2.396
11	1.136	2.641	81.765	3.337
12	1.095	2.546	84.311	4.066

In the matrix of the main components (table 2) of organizations in sports organizations of functional managers, the unrotated factor weights of each of the twelve isolated components are presented. The values

presented in the table represent the saturation of individual manifest variables with the factors marked at the top of the columns.

Table 2. Matrix of the main components of the internal organization of sports associations of functional managers

Component Matrix ^a												
	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Our club needs reorganization	.137	-.600	.222	.330	.134	-.236	.111	.360	-.064	.019	.190	-.005
2. Our club has a clear strategic direction	.027	-.045	.360	.311	-.159	.196	.490	.259	.212	-.316	-.069	.090
3. People in the management system of the club are not professional enough	.302	-.626	.244	.022	.100	-.204	.247	.208	.136	-.141	.126	-.099
4. The choice of quality athletes and talents in the club is good	-.239	.111	-.130	.406	.527	.002	.143	.269	-.086	.438	.186	-.030
5. There is a sufficient number of sponsors for the smooth operation of the club	.557	.146	.081	-.234	-.051	.360	.197	-.456	.110	.123	-.049	-.034
6. Professional people are in important positions in the club	-.003	.165	.482	.387	-.273	.025	.409	-.339	.238	.060	-.276	-.052
7. A larger number of people and volunteers are needed for the better work of the club	.035	.581	-.207	-.210	-.202	-.107	.267	.618	.035	-.008	.002	-.066
8. Managerial policy in the club is good	-.058	.087	.501	.567	.067	-.034	.091	-.008	-.411	-.225	-.043	-.269
9. In our club, great attention is paid to working with younger ages	-.209	.670	.117	-.285	-.008	-.032	-.239	.107	-.113	-.203	.208	.023
10. Clear goals and quality plans and programs were set in the club	.158	-.031	.483	.409	.496	.059	.293	-.076	-.331	.052	.016	.059
11. The club's policy is destructive	.711	-.421	-.022	-.259	-.262	-.111	-.086	.129	.076	.118	.069	.180
12. Interpersonal relations in the club are bad	-.425	-.362	-.457	.395	-.011	.168	-.090	-.198	.169	.216	-.250	.189
13. Enough is being done on club promotion and marketing	.006	.478	-.091	-.099	.369	-.499	-.042	-.302	.240	.213	.112	.030
14. In our club, everyone does the work they are responsible for	-.171	.111	.607	.344	-.038	-.072	.118	.120	.332	.036	-.119	.171
15. Massiveness is our goal	.218	.486	-.279	-.292	-.130	-.048	.304	.274	.304	.066	-.325	-.056
16. Quality and top results in the club are long-term goals	.624	.484	.380	-.209	.054	.067	.192	-.184	-.029	.001	.039	-.173

17. We have excellent communication with the environment	-.687	.436	.261	.248	.007	.116	-.143	.004	.000	.117	.109	-.308
18. The club's communication with the schools is as effective as possible	.281	.621	.470	-.191	-.131	-.112	-.143	.066	-.207	.088	.166	-.147
19. The club's communication at the international level is excellent	-.141	.003	.648	.150	-.330	.293	-.298	-.215	.091	-.059	.050	.161
20. The culture of management and athletes is at an enviable new level	.556	.553	.343	-.260	-.108	.011	.211	-.122	.086	.139	.003	-.023
21. All set goals are realistic and achievable	-.676	.340	.200	.258	-.128	.279	-.116	-.031	.139	.119	.129	-.046
22. The club works exclusively according to plan and program	.477	.270	.243	-.235	.321	-.167	-.257	.139	-.006	-.197	-.110	.304
23. Everyone follows the club's statutes and rules of conduct	-.442	.315	.226	.117	.562	-.149	.072	.103	.349	-.169	.015	.098
24. Stakeholders (interests of individuals and groups) in the club are clear enough	.632	.311	.034	-.023	.210	.116	.299	-.120	-.038	.108	.170	.258
25. Everyone in the club is one team and that's how we work	-.749	.268	.051	.092	.032	.078	-.151	.024	.174	-.007	.040	.387
26. The goals of the club are not the same for everyone and are not clear to everyone	-.014	.041	-.570	.143	-.047	.313	.063	-.216	.038	-.528	.244	-.197
27. The organization of work and tasks in the club is good	-.415	.380	.145	-.236	.573	-.116	.010	-.150	-.019	-.126	-.180	.042
28. There are long-term, medium-term and short-term plans and goals of the club	.539	.294	.013	.407	.093	-.192	-.392	.247	-.091	.024	-.096	.104
29. Our state association is a stable financial institution	.216	-.307	.659	-.300	.104	.401	.081	.075	-.028	.125	.088	.055
30. Our national association represents the basis of the development and initiation of football	.371	.140	-.105	.097	.479	.354	-.271	.188	.412	-.047	.099	-.160
31. The advantages of the club are maximum help from city structures	-.355	-.032	.188	-.206	-.246	.397	-.082	.238	-.425	.367	-.095	.140
32. Own infrastructure is a great advantage for the club	.513	.351	-.152	.261	.060	.329	-.028	-.025	-.112	.013	-.018	.113
33. The financial assistance of the club is defined by the regulation on financing	-.065	-.182	-.342	-.202	.433	.378	.417	-.077	-.012	.212	.332	.142
34. Financial support from higher levels of the state towards the club should be better	-.022	.729	-.222	.219	-.190	.008	-.212	-.108	.026	.102	.176	-.007
35. Competent and high-quality human resources work in key positions in our state association	-.615	-.026	.333	-.442	-.041	.187	-.077	.130	.246	-.086	.233	-.031
36. Our state association functions on legal regulations and laws	.493	-.089	.004	.110	.214	.521	-.497	-.071	-.033	-.156	-.073	.076
37. The plan and program provide funds for quality training of the existing staff in the club	-.403	-.224	.417	-.481	.009	.042	-.260	.128	.057	.159	-.223	-.223
38. Our national Federation has all the necessary infrastructure for the development of sports	.629	-.102	.202	.146	-.002	.375	-.311	.280	.193	-.123	.022	.058
39. Our state association has excellent cooperation with clubs	-.159	-.313	.153	-.331	.613	.258	-.107	.038	-.017	.099	-.291	-.181
40. The relationship between businessmen and our club is on an enviable new footing	.015	.482	-.305	.305	-.322	.452	.179	.341	.045	.187	-.010	-.001
41. The political environment contributes to the development of sports	-.545	.305	.079	-.231	-.071	-.070	.212	-.009	-.379	-.292	-.036	.406
42. The organization of football clubs in the county is at an enviable new level	.120	.514	-.407	.092	.318	.226	.042	.128	-.232	-.127	-.390	-.080
43. All government structures in the city/county have recognized the importance of top sport	-.496	-.078	-.108	-.392	.090	.476	.360	.080	-.055	-.219	-.003	-.016

In the structure matrix (table 3), orthogonal projections of the vector of manifest variables onto the vectors of latent dimensions are presented. Analyzing the structure of the matrix, we see that four variables have been separated into the first factor (the club's policy is destructive, we have excellent communication with the environment, all the set goals are realistic and achievable, we are all a team in the club and that's how we work), so this factor can be defined as a factor focus on achieving goals. In the second isolated factor, most of the variables were singled out (interpersonal relations in the club are bad, quality and top results in the club are long-term goals, the club's communication with schools is as effective as possible, the culture of management and athletes is at an enviable level), so this factor can be define as a factor of interpersonal relations.

In the case of the third isolated factor, variables were singled out (our club has a clear strategic direction, professional people are in important positions in the club, in our club everyone does the work for which they are responsible), so this factor can be defined as the factor of the direction of human resources. Variables have the greatest projection in the fourth isolated factor (managerial policy in the club is good, clear goals and quality plans and programs are set in the club, competent and high-quality human resources in our state association work in key positions), so this factor can be defined as a factor competitiveness of human resources. Variables have the greatest projection in the fifth isolated factor (financial support from higher levels of the state towards the club should be better, the plan and program provide funds for the quality training of the existing staff in the club, our state association has excellent cooperation with clubs, so this factor can be defined as factor systemic support for sports). Variables have the highest projection in the sixth isolated factor (enough work is done on club promotion and marketing, the club's statutes and rules of conduct are followed by everyone, the club's advantage lies in the maximum

help from city structures), so this factor can be defined as a factor in the planned direction of club activities . The biggest projection in the seventh isolated factor is the variable (financial assistance of the club is defined by the regulation on financing), so this factor can be defined as a factor of club finances. Variables have the highest projection in the eighth isolated factor (a greater number of people and volunteers are needed for the better work of the club, mass is our goal, the communication of the club at the international level is excellent, the relationship between businessmen and our club is at an enviable level, organization in clubs in the county area is at an enviable level), so this factor can be defined as a factor of the quantitative and qualitative level of human resources in the club. Variables have the greatest projection in the ninth isolated factor (there are long-term, medium-term and short-term plans and goals of the club, our state association represents the basis of development and starting football, own infrastructure is a great advantage for the club, our state federation functions on legal regulations and laws, our state federation has all the necessary infrastructure for the development of sports), so this factor can be defined as a factor of insistence support for sports. Variables have the highest projection in the tenth isolated factor (the goals of the club are not the same and clear to everyone, all government structures in the city/county have recognized the importance of top sport), so this factor can be defined as a factor of the culture of the management of sports workers. In the case of the eleventh isolated factor, variables were singled out (our club needs reorganization, there is a sufficient number of sponsors for the smooth operation of the club), so this factor can be defined as a factor of the organizational aspect of club management. In the twelfth isolated factor, the most variables were singled out (the organization of work and tasks in the club is good, the political environment contributes to the development of sports), so this factor can be defined as a factor of external and internal conditions in the club.

Table 3. Matrix of the structure of the organization of sports associations and unions of functional managers

	Structure Matrix											
	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Our club needs reorganization	.210	-.163	.136	.181	.031	.077	.036	-.281	.044	.182	.811	-.256
2. Our club has a clear strategic direction	.008	.062	.752	.125	-.069	.170	.040	.080	.057	-.161	.306	.060
3. People in the management system of the club are not professional enough	.456	.030	.233	-.026	.172	-.019	.082	-.248	.046	-.013	.690	-.368
4. The choice of quality athletes and talents in the club is good	-.448	-.284	-.135	.417	-.004	-.192	.454	.181	.018	.304	.237	.070
5. There is a sufficient number of sponsors for the smooth operation of the club	.345	.432	.201	-.055	-.081	.026	.334	-.047	.259	-.073	-.530	-.383
6. Professional people are in important positions in the club	-.145	.128	.829	.176	-.133	-.029	-.103	-.130	-.184	.122	-.205	-.167
7. A larger number of people and volunteers are needed for the better work of the club	-.125	.316	-.073	-.088	-.228	.023	-.040	.873	-.063	.014	-.005	.230
8. Managerial policy in the club is good	-.263	.173	.367	.704	-.052	.073	-.248	-.277	-.026	.040	.216	.060
9. In our club, great attention is paid to working with younger ages	-.376	.453	-.193	-.092	-.036	-.105	-.204	.234	.002	.014	-.269	.603
10. Clear goals and quality plans and programs were set in the club	.015	.177	.346	.715	.077	-.070	.338	-.316	.123	.273	.200	.023
11. The club's policy is destructive	.745	.211	-.093	-.338	-.186	.204	-.009	-.088	.283	.174	.208	-.506

12. Interpersonal relations in the club are bad	-0.197	-0.916	-0.047	-0.029	-0.015	0.062	0.086	-0.125	-0.120	-0.111	-0.085	-0.100
13. Enough is being done on club promotion and marketing	-0.124	0.188	-0.212	0.000	-0.101	-0.773	0.091	0.146	-0.120	0.344	-0.289	0.123
14. In our club, everyone does the work they are responsible for	-0.279	0.064	0.695	0.043	0.035	-0.073	-0.162	-0.122	0.007	0.378	0.180	0.192
15. Massiveness is our goal	0.130	0.223	0.045	-0.163	-0.111	-0.155	0.043	0.820	0.021	0.008	-0.309	-0.030
16. Quality and top results in the club are long-term goals	0.229	0.856	0.231	0.175	-0.118	-0.150	0.126	0.111	0.272	0.147	-0.350	-0.173
17. We have excellent communication with the environment	-0.937	-0.030	0.130	0.106	0.139	-0.018	-0.186	-0.008	-0.217	0.059	-0.120	0.378
18. The club's communication with the schools is as effective as possible	-0.140	0.838	0.030	0.073	-0.155	0.001	-0.229	0.106	0.116	0.363	-0.228	0.135
19. The club's communication at the international level is excellent	-0.275	0.172	0.498	-0.172	0.029	0.328	-0.312	-0.551	0.135	0.140	-0.116	0.165
20. The culture of management and athletes is at an enviable new level	0.192	0.810	0.272	-0.013	-0.200	-0.108	0.092	0.230	0.180	0.272	-0.409	-0.121
21. All set goals are realistic and achievable	-0.860	-0.165	0.246	-0.079	0.039	0.112	-0.093	-0.051	-0.153	0.006	-0.170	0.393
22. The club works exclusively according to plan and program	0.394	0.485	-0.076	0.098	0.021	-0.272	-0.087	0.067	0.464	0.345	-0.072	0.252
23. Everyone follows the club's statutes and rules of conduct	-0.437	-0.059	0.224	0.127	0.291	-0.569	0.108	0.098	-0.010	0.133	0.119	0.563
24. Stakeholders (interests of individuals and groups) in the club are clear enough	0.355	0.470	0.104	0.220	-0.344	-0.157	0.488	0.145	0.336	0.162	-0.236	-0.122
25. Everyone in the club is one team and that's how we work	-0.622	-0.338	0.103	-0.189	0.090	-0.045	-0.054	-0.010	-0.205	0.079	-0.123	0.706
26. The goals of the club are not the same for everyone and are not clear to everyone	-0.047	-0.223	-0.185	0.049	-0.277	-0.082	0.112	0.112	0.122	-0.841	-0.151	-0.049
27. The organization of work and tasks in the club is good	-0.269	0.082	-0.066	0.188	0.465	-0.454	0.107	0.064	-0.166	0.086	-0.239	0.597
28. There are long-term, medium-term and short-term plans and goals of the club	0.137	0.194	-0.121	0.392	-0.458	-0.174	-0.288	0.152	0.568	0.424	0.004	-0.100
29. Our state association is a stable financial institution	0.192	0.401	0.356	-0.127	0.452	0.399	0.281	-0.394	0.238	0.188	0.182	-0.074
30. Our national association represents the basis of the development and initiation of football	-0.039	0.078	-0.082	0.056	0.055	-0.304	0.246	0.175	0.796	-0.033	-0.015	-0.156
31. The advantages of the club are maximum help from city structures	-0.272	-0.033	-0.051	-0.099	0.248	0.745	0.042	-0.036	-0.173	0.190	-0.091	0.249
32. Own infrastructure is a great advantage for the club	0.123	0.198	-0.002	0.349	-0.438	0.034	0.187	0.205	0.528	0.010	-0.337	-0.135
33. The financial assistance of the club is defined by the regulation on financing	0.048	-0.198	-0.181	-0.033	0.166	0.003	0.891	0.055	-0.028	-0.243	0.011	-0.016
34. Financial support from higher levels of the state towards the club should be better	-0.452	0.159	-0.151	0.053	-0.549	-0.176	-0.149	0.315	0.101	0.060	-0.485	0.158
35. Competent and high-quality human resources work in key positions in our state association	-0.443	0.059	0.121	-0.551	0.534	0.149	-0.017	-0.136	-0.228	-0.119	0.128	0.466
36. Our state association functions on legal regulations and laws	0.240	0.061	-0.114	0.164	-0.015	0.141	0.039	-0.242	0.825	-0.069	-0.196	-0.160
37. The plan and program provide funds for quality training of the existing staff in the club	-0.190	0.050	-0.001	-0.364	0.759	0.226	-0.228	-0.203	-0.188	0.190	0.092	0.146
38. Our national Federation has all the necessary infrastructure for the development of sports	0.283	0.238	0.169	0.000	-0.134	0.192	-0.047	-0.065	0.829	0.077	0.127	-0.267
39. Our state association has excellent cooperation with clubs	0.036	-0.120	-0.132	0.074	0.835	-0.015	0.277	-0.164	0.141	0.051	0.061	0.047
40. The relationship between businessmen and our club is on an enviable new footing	-0.371	-0.055	0.125	0.082	-0.470	0.324	0.134	0.618	0.198	-0.101	-0.260	-0.011
41. The political environment contributes to the development of sports	-0.178	0.040	0.022	0.040	0.077	0.136	-0.039	0.080	-0.506	-0.118	-0.150	0.807
42. The organization of football clubs in the county is at an enviable new level	-0.037	-0.010	-0.240	0.522	-0.079	-0.127	0.124	0.586	0.275	-0.152	-0.419	0.171
43. All government structures in the city/county have recognized the importance of top sport	-0.171	-0.154	0.045	-0.171	0.479	0.293	0.379	0.144	-0.260	-0.532	-0.037	0.373

The correlation of the matrix of isolated components (table 4) shows that the first factor has the highest

correlation with the twelfth factor (-.323), which can be characterized as a weak correlation.

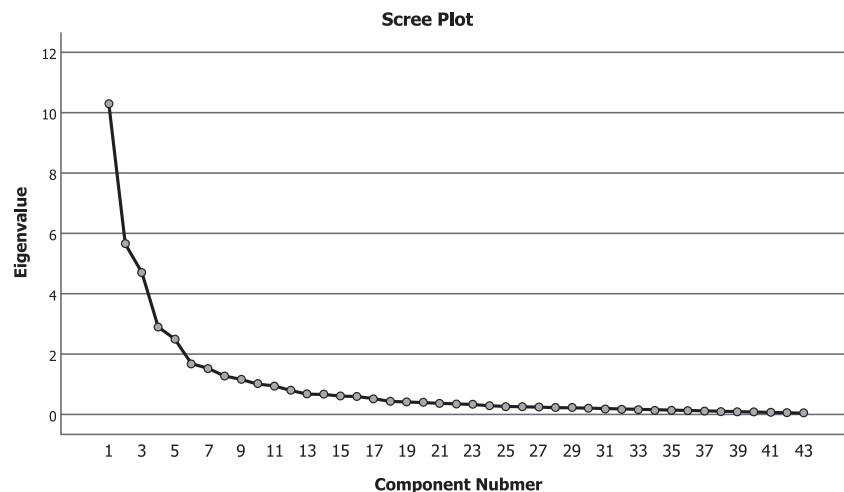
Table 4. Intercorrelation matrix of isolated components of the organization of sports organizations

Component Correlation Matrix												
Com.	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000	.145	-.069	-.021	-.039	.002	.075	-.051	.144	-.034	.085	-.323
2	.145	1.000	.130	.006	-.048	-.028	-.047	.061	.149	.175	-.150	.035
3	-.069	.130	1.000	.043	.001	.089	-.007	-.133	-.012	.048	.076	-.018
4	-.021	.006	.043	1.000	-.124	-.113	.089	.013	.121	.065	.015	.001
5	-.039	-.048	.001	-.124	1.000	.031	.107	-.183	-.109	-.005	.128	.164
6	.002	-.028	.089	-.113	.031	1.000	-.038	-.100	-.021	-.094	.046	-.046
7	.075	-.047	-.007	.089	.107	-.038	1.000	.082	.067	-.077	-.031	-.061
8	-.051	.061	-.133	.013	-.183	-.100	.082	1.000	.023	-.062	-.143	.086
9	.144	.149	-.012	.121	-.109	-.021	.067	.023	1.000	.062	-.047	-.142
10	-.034	.175	.048	.065	-.005	-.094	-.077	-.062	.062	1.000	.043	.010
11	.085	-.150	.076	.015	.128	.046	-.031	-.143	-.047	.043	1.000	-.070
12	-.323	.035	-.018	.001	.164	-.046	-.061	.086	-.142	.010	-.070	1.000

By looking at the scree plot, we can see the exact break of the curve, which tells us about taking factors at the relevant level among functional managers,

that is, the most dominant factors were clearly distinguished (graph 1).

Graph 1. Scree plot of isolated components of the organization of sports organizations of functional managers



CONCLUSION

As a research technique, factor analysis is such that the interpretation of these results is always largely left to the personal judgment of the researcher, and not to any firm statistical rules. The number of factors obtained by factor analysis is often large, which was also the case this time. Using the method of principal components for functional managers, 12 isolated factors were extracted, which exhaust 84.3% of the common valid variance. Orthogonal projections of vectors of manifest variables onto vectors of latent dimensions are presented in the structure matrix. Analyzing the structure of these variables, we can see that twelve isolated factors were singled out, each explaining and hypothetically covering certain

areas of this research in their own way. Each of these isolated factors is determined by the variables that have the highest projections on each of the twelve isolated factors. It can be seen that all twelve isolated factors are dominated by variables and answers that hypothetically cover the work space and mid-level management competencies, and that the main focus of the respondents is on the competencies of functional managers, i.e. the mid-level management of the organization they belong to. In some isolated factors, one can also notice a focus on top management jobs, which is to some extent expected considering the job description of respondents who are part of functional management.

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REASONS FOR ABSENCE FROM CLASSES OF MALE AND FEMALE STUDENTS IN PRIMARY SCHOOLS

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ABSTRACT: The absences of elementary school students have become a daily occurrence. Experiences from school practice show that this problem is difficult to solve, primarily due to the number of factors that influence absenteeism. It was the number of factors and reasons for student absenteeism that prompted us to carry out the research, but also the possibility of possibly looking at the problem of absenteeism from the student's point of view. Following the above, the work aimed to determine, explain and present the reasons why students in elementary school are absent from Physical and Health Education classes. The sample is the basis of which data was collected in two elementary schools in the Ilijaš municipality from grades 5-9, with 150 students of both sexes (44% boys and 56% girls). Students will answer 30 survey questions with a multidimensional survey questionnaire, which is divided into 4 parts. The independent variables are the sociodemographic characteristics of the respondents (gender, grade, school performance, absenteeism). Dependent variables include absenteeism (absence from physical and health education classes), that is, attitudes about absenteeism (physical and health education). In that part of the questionnaire, using a Likert scale, students' opinions about absenteeism are examined. Qualitative and quantitative methods were used for data processing. After the conducted research, one of the confirmed assumptions is that students attend more physical and health education classes compared to other subjects where mathematics and BHS language subjects were used for comparison, where the number of absences is visibly higher. In this research, there was no significant level of difference in absences concerning gender, nor was there a large difference in the number of absences in lower grades compared to higher grades and vice versa. The number of exempted female students is partially higher compared to male students, while non-participation of students in classes does not depend on the gender difference. The recommendation based on the results is that the problem of school absences must be treated as a complex phenomenon that should be approached in a multidisciplinary manner.

Keywords: *absences, student, school, teaching, sport*

INTRODUCTION

Absenteeism, i.e. the absence of students from classes, is an inevitable phenomenon and quite frequent in our schools. Contemporary physical education faces numerous challenges and changed expectations of society, new strategies and approaches are sought that would best respond to the changed social context and diverse needs of students (Hardman, 2007). Absenteeism entails a whole series of other negative consequences for both the student and the entire educational system. There is not a single teacher's or class council that does not discuss the issue of student absenteeism, all to find a way to objectively analyze students' reasons, causes, and consequences of their absence from class (Bezinović, Smojver Ažić, 2000), whether justified or unjustified. . And after that, of course, to take measures to suppress the increasingly frequent avoidance of classes, pedagogical measures prescribed by the school statute are also foreseen. The school statute is the basic document that prescribes the rights and duties of students. Therefore, every student is obliged to attend classes regularly, and in the case of being prevented from doing so, he is obliged to justify his absence promptly. Based on the available literature (Najšteter, 1997, Findak, 1999), we can conclude that a teacher should behave naturally, be friendly, and cordial, always available to students, encourage joint work and success, believe in them, and radiate positive energy and cheerfulness. One of the ways to successfully carry out the teaching process is two-way cooperation between the teaching subjects, i.e., teacher and student, this implies adapting oneself to the suggestions of the other and

vice versa (Rašidagić, Manić, Mahmutović, 2016). Shulman and Lee in their research carried out (1987) claim that the professional knowledge of teachers must not be questioned in any form and should include at least: knowledge of the material, knowledge of broad principles and strategies of teaching organization, knowledge of teaching certain topics, knowledge of students, knowledge of pedagogical goals and values. In a certain segment, the teacher also has the role of raising students, which implies a teacher who respects both himself and others, is punctual and disciplined in fulfilling his obligations and has a neat appearance, is measured in his demands, is polite in communicating with students, sufficiently clear, loud, a man of strong will. School absenteeism is one of the biggest problems facing schools today. The problem occurs on a global level, in almost all countries of the world, so Yahaya, Ahmad, N & Abdalla, (2010) state that absenteeism is one of the ten biggest problems in the American school system, which was one of the motivating factors for this research. . After determining the reasons for absenteeism, this research will offer possible preventive measures.

METHODS

A sample of respondents

The research was conducted in two elementary schools in the Ilijaš municipality (5-9 grades). 150 students of both sexes (44% boys and 56% girls) were examined. Students will answer 30 survey questions. In the fifth grade, the ratio of male to female students is 11 to 26, in the sixth grade there are 19 male and 17 female

students, in the eighth grade, there are 18 male and 17 female students, while in the ninth grade there are 22 male and 20 female students.

Sample variables

Data collection techniques were used in this research: work on documentation and survey techniques. The research was conducted with a multidimensional survey questionnaire that consisted of four parts: a sociodemographic dimension that includes variables: gender, age, grade, general school performance at the end of the previous grade, a dimension that refers to parents, and includes a variable: the justification of the child's absence, the dimension related to the student's opinion on the reasons for absenteeism, the student's opinion on the subject of physical and health education. A specially created survey questionnaire was used to conduct the research. The questionnaire contains a total of 30 questions, which are divided into 4 parts. Four questions refer to socio-demographic data: gender, class, school success, and absenteeism from physical and health education classes, and we defined them as independent variables. The second part of the questionnaire (8 questions) examined the representation of certain topics included in the plan and program, and a 3-level Likert scale was used (1- yes, 2- sometimes, 3- no), and whether students share the gymnasium with other classes. The third part of the questionnaire, in which the same scale was used, refers to the examination of attitudes about lectures in physical and health education. The fourth part of the questionnaire refers to questions about absenteeism (reasons for absence, whether absent students should be sanctioned more, what kind of time is spent if they are not in physical and health education classes). In that part of the questionnaire, using a Likert scale, students' opinions about absenteeism are examined. The independent variables are the sociodemographic

characteristics of the respondents (gender, grade, school performance, absenteeism). Dependent variables include absenteeism (absence from physical and health education classes), that is, attitudes about absenteeism (physical and health education).

Data processing methods

Qualitative and quantitative methods were used for data processing. Databases were created, while processing and analysis were performed using statistical software R 4.0.3. R represents an integrated programming environment for data management, calculation, and graphical display of results. The collected data were described and analyzed using appropriate statistical methods. Variables such as absence from physical and health education classes, reasons for absence, representation of certain topics during physical and health education classes, support of parents of unjustified absences, etc. are classified as categorical variables. Differences were considered statistically significant if the calculated level of statistical significance was less than 0.05 ($p < 0.05$). The χ^2 test was used to examine the differences between the independent and dependent variables and the significance of the differences was assessed.

RESULTS

Within the descriptive statistical analysis, it can be concluded that there is a higher number of absences from classes in the subjects of mathematics and BHS language, compared to physical and health education classes. The reason for this can be found in the unpreparedness of students for tests in mathematics and BHS language classes, which can be significantly more complicated, and require a greater number of hours spent studying.

Table 2. Number of absences from mathematics, BHS language, and physical and health education

Grade	Mathematics			BHS language			Physical and health education		
	Absences	%	Hours	Absences	%	Sati	Absences	%	Hours
Sixth	36	0.007	5180	24	0.004	6475	6	0.002	2590
Seventh	51	0.01	5040	39	0.007	5040	8	0.003	2520
Eighth	48	0.01	4900	42	0.008	4900	11	0.004	2450
Ninth	48	0.008	5712	45	0.007	5880	13	0.004	2856

$\chi^2 = 1.844$; $df = 1.656$; $p\text{-value} = 0.406$

Table 3. Grades from the subject of physical and health education according to gender distribution

Gender	Grade											
	1		2		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Male students	2	1.33	0	0	3	2.00	23	15.55	42	28.00	70	46.65
Female students	0	0	0	0	0	0	10	6.66	70	46.66	80	53.35
Total	2	1.33	0	0	3	2.00	33	22.21	112	74.66	150	100

$\chi^2 = 16.528$; $df = 3$; $p\text{-value} = 0.0008$

The results of the χ^2 test indicate that there is a significant difference when it comes to grades from the subject of physical and health education according to gender distribution. Two male students had a final grade of 1 (table 3), while no female students had a final grade of 1. None of the male and female students had a final grade of 2. Two male students had a final

grade of 3, while none of the female students had a final grade of 3. 15.55 % of male students had a final grade of 4, while 6.66% of female students had a final grade of 4 in the subject of physical and health education. 28.00% of male students and 46.66% of female students had a final grade of 5.

Table 4. Absence from classes according to gender difference

Gender	Total number of students		Absences					
			Ne		Sometimes		No Attendance	
	N	%	N	%	N	%	N	%
Female students	80	53.30	57	38.00	23	15.30	0	0
Male students	70	46.70	57	38.00	13	8.70	0	0
Total	150	100	114	76.00	36	24.00	0	0
$\chi^2 = 1.5992$; $df=1$; $p\text{-value}=0.206$								

An equal number of male and female students do not miss classes. Furthermore, 15.30% of female students are sometimes absent, 8.70% of male students are sometimes absent from physical and health education

classes, and there are no registered students who do not attend classes at all, which includes exemption from physical and health education.

Table 5. Results on the question: "Are you exempt from physical and health education classes" by gender

Gender	Are you exempt from classes?							
	I am not exempt		I am exempt from major efforts in class		I am exempt		Total	
	N	%	N	%	N	%	N	%
Male students	55	36.66	11	7.33	4	3.33	70	47.32
Female students	68	45.33	7	4.66	5	2.66	80	52.65
Total	123	81.99	18	11.99	9	5.99	150	100
$\chi^2 = 3.6429$; $df=2$; $p\text{-value}=0.162$								

The majority of students, 124 (81.99%) were not exempted from classes, 11 (7.33%) male students

were exempted from major efforts, while 4.66% of female students were exempted from major efforts.

Table 6. (Non)participation of students during classes by gender

Gender	Survey question: "During the class time" (circle the answer provided)							
	I am an active participant in the class		I am a passive participant		Exempted for justifiable reasons		Total	
	N	%	N	%	N	%	N	%
Male students	52	34.66	14	9.33	4	2.66	70	46.65
Female students	68	45.33	11	7.33	1	0.66	80	53.32
Total	120	79.99	25	16.66	5	3.22	150	100
$\chi^2 = 3.6429$; $df=2$; $p\text{-value}=0.162$								

A total of 120 (63.46%) surveyed students actively participate in classes. While 16.66% sit passively, and male students are more passive than female students,

male students are more often freed from activities of greater effort than female students.

Table 7. Results of the survey question: how important do you think the subject of physical and health education is according to gender

Gender	Survey question: "how important do you consider the TOIZ subject" (circle the answer provided)											
	I consider it a very important		Very important		Important		I consider it of medium importance		I don't consider it as important		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Male students	7	4.66	25	16.66	28	18.66	7	4.66	3	2.00	70	46.65
Female students	11	7.33	20	13.33	40	26.66	5	3.33	4	2.60	80	53.32
Total	18	11.99	45	20.00	68	45.23	12	8.00	7	4.60	150	100
$\chi^2 = 0.495$; df= 4; p-value=0.495												

The results of the χ^2 test indicate that there was no significant difference ($p > 0.05$) in the importance of the subject according to gender. The largest number of male and female students believe that the subject of physical and health education is important, 45.23%

of them, while 7 male and 5 female students consider it a medium important subject, those who do not consider it important are a total of 7 students, of which 3 male and 4 female students.

Table 8. Reasons for passive sitting by gender

Gender	Reasons for passive sitting by gender													
	Illness (I have a medical certificate)		Menstrual cycle		Insufficient motivation		I am not interested		The professor does not require us to actively participate in class		Working conditions (multiple classes in one gymnasium, lack of props and teaching aids)		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Male students	17	21.25	0	0	2	2.5	4	5.00	8	10.00	2	2.50	33	41.25
Female students	13	16.25	26	32.50	1	1.25	1	1.25	4	5.00	2	2.50	47	58.75
Total	30	37.50	26	32.50	3	3.75	5	6.25	12	15.00	4	5.00	80	100
$\chi^2 = 28.42$; df=5; p-value=0.0003														

The results of the χ^2 test indicate that there is a significant difference between genders. Female students passively sit in class only during their menstrual cycle, or if they are sick and have an excuse. Male students, apart from sitting passively when they

are sick and have an excuse, are less motivated, or they are more critical of working conditions, such as, for example, an insufficient number of props or they are passive because even the teacher does not ask them to be active.

Table 9. Reasons for absenteeism from physical and health education classes in relation to gender

Gender	Reasons for absenteeism											
	Illness (cold, injuries, etc...)		Insufficient motivation		Other reasons		I am not interested, this subject is not important to me		Working conditions (multiple classes in one gymnasium, lack of props and teaching aids)		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Male students	25	24.04	6	5.77	11	10.57	3	2.88	2	1.92	47	45.19
Female students	41	39.42	2	1.92	14	13.46	0	0.00	0	0.00	57	54.8
Total	66	63.46	8	7.69	25	24.03	3	2.88	2	1.92	104	100
$\chi^2 = 10.373$; df=4; p-value=0.034												

The students who state that the subject is irrelevant to them are boys (2.88%), not a single female student, and two students claim that the reasons for their absence are inadequate conditions in the classroom.

According to motivation, the results of our survey show that three times more students (boys) are absent due to a lack of motivation than girls (students).

Table 10. During my absence from physical and health education classes, I spend time: (circle the offered answer), in relation to gender

Gender	During my absence from physical and health education classes, I spend my time:													
	I don't miss classes unjustifiably		I go home		Near the school		In a cafe		I meet with my girlfriend/boyfriend/friends		I go anywhere, as long as I'm not at school		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Male students	45	30.00	5	3.33	8	5.33	7	4.66	2	1.33	3	2.00	70	46.65
Female students	71	47.33	0	0	6	4.00	1	0.66	2	1.33	0	0	80	54.35
Total	116	77.33	5	3.33	14	9.33	8	5.22	4	2.66	3	2.00	150	100
$\chi^2 = 18.027$; $df=5$; $p\text{-value}=0.003$														

The results of the χ^2 test indicate that there is a significant difference. The majority of students, 77.33% of them, answered that they are not absent without an excuse. If they are absent, students spend

time at home or near the school. (Boys), in smaller numbers, 3 of them (2.00%) answered that they go anywhere as long as they are not in class.

Table 11. The teacher's attitude towards work in class in relation to the class they attend

The teacher's attitude towards work in class	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
He has his own rules, he doesn't respect the opinion of others	6	4.00	7	4.66	6	4.00	12	8.00	31	20.66
He respects the opinion of others, is inclined to agree and compromise	30	20.00	24	16.00	26	17.33	30	20.00	110	73.33
No rules are set, and students dominate the class	1	0.66	5	3.33	3	2.00	0	0	9	6.00
Total	37	24.66	36	23.99	35	23.33	42	28.00	150	100
$\chi^2 = 9.717$; $df=6$; $p\text{-value}=0.137$										

More than half, i.e., 73.33% of the students claim that the teacher "Respects the opinion of others, tends to agree", 20.66% of the students believe that the teacher "Has his own rules, does not respect the opinion of others". Only 6.0% believe that the teacher

"does not set rules, the students dominate the class". This last statement was not confirmed by ninth-grade students, and the largest number, 5 of them, attend seventh grade. However, statistical significance was not shown.

Table 12. Analysis of students' opinions on the question: "Is the teacher boring?" concerning the class they attend

Is the teacher boring?	Grade									
	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
I completely disagree	15	10.00	7	4.66	4	2.66	13	8.66	39	26.00
I disagree	14	9.33	13	8.66	14	9.33	14	9.33	55	36.66
I neither agree nor disagree	6	4.00	10	6.66	8	5.33	11	7.33	35	23.33
I agree	1	0.66	4	2.66	6	4.00	2	1.33	13	8.66
I completely agree	1	0.66	2	1.33	3	2.00	2	1.33	8	5.33
Total	37	24.66	36	23.99	31	23.32	35	27.99	150	100
$\chi^2 = 14.971$; $df=12$; $p\text{-value}=0.243$										

About 63% of male and female students think that the teacher of physical and health education is not boring, while about 14% of them think that he is. The

teacher is the least boring for students in the sixth and ninth grades, while students in the seventh and eighth grades think the teacher is boring.

Table 13. Analysis of the survey question: "During classes, we usually share the hall with:" in relation to the class attended by male and female students

Accessibility of the hall	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
We do not share the hall	32	21.33	29	19.33	31	20.66	34	22.66	125	83.98
With one grade	4	2.66	4	2.00	3	2.00	6	4.00	17	10.66
With two grades	1	0.66	1	0.66	0	0	1	0.66	3	1.98
With three grades	0	0	2	1.33	1	0.66	2	0.66	5	2.65
Total	37	24.65	36	23.326	35	23.32	43	27.92	150	100
$\chi^2 = 3.842$; $df=9$; $p\text{-value}=0.921$										

Table 14. Representation of athletics according to the classes attended by students

Athletics	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	30	20.00	28	18.66	30	20.00	27	18.00	105	76.66
Sometimes	3	2.00	6	4.00	2	1.33	13	8.66	24	9.33
No	4	2.66	2	1.33	3	2.00	2	1.33	11	0.66
Total	37	24.66	36	23.99	35	23.33	42	27.99	150	100
$\chi^2 = 12.154$; $df=6$; $p\text{-value}=0.058$										

Athletics is equally represented in all classes, and a total of 76.66% of male and female students answered affirmatively. Only 0.66% of students from

the examined classes did not have athletics in their classes. The results of the χ^2 test indicate that there is a significant difference.

Table 15. Representation of Volleyball according to classes attended by students

Volleyball	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	35	23.33	33	22.00	32	21.33	34	22.66	134	92.66
Sometimes	1	0.66	1	0.66	1	0.66	7	4.66	10	6.64
No	1	0.66	2	1.33	2	1.33	1	0.66	6	3.98
Total	37	24.66	36	23.99	35	23.33	42	37.99	150	100
$\chi^2 = 10.313$; $df=6$; $p\text{-value}=0.119$										

92.66% of students answered affirmatively that they had a volleyball topic in class, while only 3.98% (6 students) answered negatively.

Table 16. Representation of handball according to classes attended by students

Handball	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	22	14.66	22	14.66	21	14.00	28	18.66	93	62.00
Sometimes	12	8.00	12	8.00	9	6.00	12	8.00	45	30.00
No	3	2.00	2	1.33	5	3.33	2	1.33	12	8.00
Total	37	26.66	36	10.00	35	29.33	42	34.00	150	100
$\chi^2 = 3.211$; $df=6$; $p\text{-value}=0.782$										

62.00% of students answered affirmatively that they had a volleyball topic in class, while 8.00% (12

students) answered negatively. 30% of students answered that they sometimes have a handball topic.

Table 17. Representation of football according to classes attended by students

Football	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	30	20.00	34	22.66	33	22.00	28	18.66	125	83.32
Sometimes	1	0.66	2	1.33	1	0.66	9	6.00	13	8.65
No	6	4.00	0	0	1	0.66	5	3.00	12	7.66
Total	37	24.66	36	23.99	35	23.32	42	27.66	150	100
$\chi^2 = 21.451$; $df=6$; $p\text{-value}=0.001$										

83.32% of students answered affirmatively that they had a football topic in class, while 8.65% (13 students) answered that they sometimes did. 7.66% of students answered that they do not have a handball topic. The topic of football is not equally represented

in all classes. Seventh-grade students have football topics and there is no negative answer, while sixth-grade students often did not, but sometimes covered football topics. The results of the χ^2 test indicate that there is a significant difference.

Table 18. Representation of martial arts according to classes attended by students

Martial arts	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	8	5.33	9	6.00	12	8.00	13	8.66	42	28.00
Sometimes	2	1.33	2	1.33	3	2.00	9	6.00	16	10.66
No	27	18.00	25	16.66	20	13.33	20	13.33	92	61.33
Total	37	26.66	36	23.99	35	23.33	42	27.99	150	100
$\chi^2 = 10.151$; $df=6$; $p\text{-value} = 0.118$										

28.00% of the students answered affirmatively that they had a martial arts topic in class, while more than half of the students (61.33%) answered negatively.

10.66% of students answered that they sometimes have martial arts topics

Table 19. Representation of basketball according to classes attended by students

Basketball	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	31	20.66	32	21.33	30	20.00	32	21.33	125	83.32
Sometimes	1	0.66	2	1.33	4	2.66	9	6.00	16	10.65
No	5	3.33	2	1.33	1	0.66	1	0.66	9	6.65
Total	37	24.22	36	23.99	35	23.32	51	27.99	150	100
$\chi^2 = 7.397$; $df=6$; $p\text{-value} = 0.042$										

83.32% of students answered affirmatively that they had a basketball topic in class, while 10.65% (16 students) answered that they sometimes did. 6.66% of students answered that they do not have a

basketball topic. The subject of handball is not equally represented in all classes. Sixth-grade students more often did not, but sometimes covered topics from basketball.

Table 20. Representation of gymnastics according to classes attended by students

Gymnastics	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	16	10.66	18	12.00	19	12.66	27	18.00	80	83.33
Sometimes	12	8.00	13	8.66	6	6.66	4	7.33	35	12.66
No	9	6.00	5	3.33	6	4.00	4	2.66	24	4.00
Total	37	24.66	36	23.99	31	23.32	35	27.99	150	100
$\chi^2 = 5.274$; $df=6$; $p\text{-value}=0.508$										

83.33% of students answered affirmatively that they had a topic from gymnastics in class, while 4.00% of students answered negatively. 12.66% of students

answered that they sometimes have topics from gymnastics.

Table 21. Results of answers to the question: "Do parents support absences?" according to the class the student attends

Do parents support absences?	Grade									
	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
I don't agree at all	22	14.66	17	11.33	19	12.66	21	14.00	79	52.66
I disagree	10	6.66	11	7.33	11	7.33	14	9.33	46	30.66
I neither agree nor disagree	5	3.33	4	2.66	4	2.66	4	2.66	17	11.33
I agree	0	0	1	0.66	0	0	1	0.66	2	1.33
I completely agree	0	0	3	2.00	1	0.66	2	1.33	6	4.00
Total	37	24.66	36	23.99	31	23.32	35	27.99	150	100
$\chi^2 = 9.717$; $df=6$; $p\text{-value}=0.137$										

More than half (83.22%) of students' parents of all grades do not support absences in physical and health education classes, while only 8 (5.33%) students

support absences in classes. Parents of sixth graders do not support, and the largest number of parents who support (4) are parents of seventh graders.

Table 22. Results of answers to the question: "Do teachers of other subjects give importance to physical and health education?" depending on which class the student attends

Teachers of other subjects give importance to physical and health education	Grade									
	6 th grade		7 th grade		8 th grade		9 th grade		Total	
	N	%	N	%	N	%	N	%	N	%
Yes	10	6.66	12	8.00	7	4.66	12	8.00	41	27.33
Sometimes	21	14.00	14	9.33	16	10.66	20	13.33	71	47.33
No	6	4.00	10	6.66	12	8.00	10	6.66	38	25.33
Total	37	24.66	36	23.99	35	23.32	42	27.99	150	100
$\chi^2 = 4.889$; $df=6$; $p\text{-value}=0.558$										

Do teachers of other subjects give importance to physical and health education?" in relation to the class that students attend. Our results show that most often (47.33%), teachers sometimes give importance, while the answers: Yes and No are almost equal proportions. Students believe that 27.33% of teachers of other subjects give importance, and 25.33% do not

give importance to this subject. The results are shown in graph 23. We carried out further research in terms of examining students' opinions, how much absences from the subject of physical education and health education affect grades, and whether they think they deserved the grades they received.

Table 23. Results of the analysis of students' opinions on whether absences affect the grade obtained well

Do absences affect grading?	Grade									
	1		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%
They do not affect at all	2	1.33	0	0	0	0	2	1.33	4	2.66
They do not affect	0	0	1	0.66	2	1.33	1	0.66	4	2.66
They neither affect nor do they not affect	0	0	1	0.66	11	7.33	22	14.66	34	22.66
They affect	0	0	1	0.66	16	10.66	41	27.33	58	38.66
They are extremely influential	0	0	0	0	4	2.66	46	30.66	50	33.33
Total	2	1.33	3	2.99	33	21.98	112	74.66	150	100
$\chi^2 = 98.303$; $df=12$; $p\text{-value}=0.0002$										

"To what extent do you think that absences affect success in the subject of physical and health education?" show a significant difference in the opinion of the surveyed students in relation to their success in the subject of physical and health education ($p < 0.05$). Two students. Most of the respondents had excellent grades, 112 of them (74.66%), most of whom consider that they have an exceptional impact, and only two excellent students believe that they do not have an exceptional impact. Our examined students were not assessed with a sufficient grade (2). Only three students were evaluated with a good

grade (3), and they think that absences do not affect (one respondent), neither affect nor affect (one respondent), affect (one respondent). There was a total of 33 very good students (21.98%), and most very good students believe that absences affect the final grade, then that they neither affect nor do not affect, none of the very good students answered that they do not affect extremely well, and only four very good respondents believe that extremely influential. The results of the χ^2 test indicate that there is a significant difference.

Table 24. Results of the analysis of the answers to the question: In order to deserve the grade (to be supplemented with the offered answers)

In order to deserve the grade	Grade									
	1		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%
I'm not trying	0	0	1	0.66	1	0.66	0	0	2	1.33
I get the grade with little effort	2	1.33	0	0	4	2.65	9	6.00	15	10.00

"To earn a grade in physical and health education" (fill in one of the forced answers). The graded honors answered that they must work hard and strive for the grade, and no student with a final grade of 5 answered that they don't have to work hard, a smaller number of honors get the grade with little effort. Out of the total number of students examined, only two answered that they did not work hard for the obtained grade, one with a grade of 3 and the other student

with a grade of 4. An interesting answer was given by two students who were graded with a negative grade (1), which is to get a grade with little effort. We subjected these answers to statistical testing, which showed that the relationship between the difference in answers and students' grades is statistically significant ($p < 0.05$). The results of the χ^2 test indicate that there is a significant difference.

Table 25. Results of the analysis of the question: "Did you deserve the grade?" according to the students' grades?

Did you deserve the rating?	Grade									
	1		3		4		5		Total	
	N	%	N	%	N	%	N	%	N	%
I didn't deserve it	0	0	1	0.66	1	0.66	2	1.33	4	2.65
I deserved it	2	1.33	2	1.33	32	21.33	110	73.33	146	97.33
Total	2	1.33	3	1.99	33	21.99	112	74.66	150	100
$\chi^2 = 11.373$; $df = 3$; $p\text{-value} = 0.01$										

A significant difference was shown ($p < 0.05$). 97.33% of students believe that they deserved the grade, while only four students (2.65%) think that they did not, and of these two students who were graded with a grade of 5, one with a grade of 4 and one with a grade of 3. the students with an insufficient grade believe that they deserved a grade of one (F).

DISCUSSION

The purpose of the conducted research was to analyze student absenteeism, investigate the students' attitude towards absenteeism, discover the real causes, and look at the possible consequences of this unwanted phenomenon, which increasingly characterizes everyday school life, and is especially present in the subject of Physical and Health upbringing.

The results of the analysis of the survey questionnaire indicate that there is a higher number of absences from classes in the subjects of mathematics and BHS language, compared to physical and health education classes, but there is no gender difference in the avoidance of physical and health education classes of the examined male and female students at the elementary school "Stari Ilijaš" and "Hašim Spahić" in the area of Ilijaš Municipality. The reason for this can be found in the students' unpreparedness for tests in mathematics and BHS language classes, which can be significantly more complicated and require a greater number of hours spent studying. However, with further analysis, we observed that there is a significant gender difference in the unjustified absence of male and female students. Based on the results obtained this way, we can say that the results of the analysis of our data indicate that there

is gender inequality in absenteeism from physical and health education classes. According to the data of other researchers, although at first physical education does not appear to be different from other subjects, previous studies have established that the engagement of physical education teachers in the promotion of sports and healthy living among students reduces the prevalence of health problems, and the participation of younger adolescents in sports activities at school and involvement in school sports sections increase satisfaction with school in the later period, reduces the crime rate among young people and has a positive effect on personal development and the development of social skills. Therefore, the physical education teacher needs to direct professional competencies toward improving the general quality of life for children and a healthy lifestyle. Research that dealt with attitudes towards the subject of physical and health education supports the previously stated finding that students have the most positive opinion about the professional competence of teachers: imparting knowledge, clearly demonstrating material, professional enthusiasm, and setting a personal example through a healthy lifestyle, and some results indicate to the negative evaluation of the professional competencies of physical education teachers if they are not demonstrated sufficiently during class, which is one of the most important reasons for giving up the teaching job. (Miličković, V., Vukičević, V., Milovanović I. 2017). In the teaching methodology of Physical Education and Sports, the program contents must enable the learning of more complex motor activities for which it is necessary to first adopt the techniques of certain elements, which form the basis for the development of the structures of an individual's motor program. It is necessary to adopt a certain fund from basic sports (athletics, gymnastics), sports games (basketball, volleyball, handball, football) and martial arts (Rašidagić, F., Manić, G., Mahmutović, I. 2016).

Based on the MANOVA-test, we concluded that there is no statistical difference in the representation of topics according to classes, and according to our results, teachers devote sufficient attention to these topics in all examined school classes according to the plan and program.

To the question Do parents support absences from physical and health education classes? We compared the answers according to the different classes that students attend, and our results show that 83.22% of parents do not support absenteeism from physical and health education classes. Since parents play a critical role in development and socialization, parental social support can be an important factor that complements teachers' efforts to increase student satisfaction and involvement in physical and health education classes (Shen, B., et al. 2018).

Lack of supervision and lack of discipline in early childhood is manifested by avoiding school, dissatisfaction, hostility, and often aggression. (Zrilić, S. 2007).

The abstinence of male and female students can also be influenced by the opinions of teachers of other subjects about the importance of teaching physical and health education, according to the results of

the surveyed students, teachers of other subjects most often "Sometimes" attach importance to the subject of physical and health education, and there is no difference compared to the class that attends. Avoidance of physical education and health education can also be influenced by the opinions of teachers of other subjects about this subject. For the most part, physical and health education teachers are not required to show and explain criteria for measuring student progress or significant indicators of the achievement of the assigned teaching content, and therefore there is marginalization in the teaching of physical and health education, which is visible in several aspects that articulate student and teachers' beliefs and beliefs from the local environment of schools where the importance of the content of Physical and Health Language in k. is not perceived on the context of the goals of upbringing and education (Žnidarec-Čučković, A. 2018). Our research has shown that there is a significant difference between differently graded students and opinions about how absences from this subject affect the final grade. We can conclude that there is a significant difference between differently graded male and female students and their opinion about deserving a grade in the subject. The majority of students with a final grade of 5 and 4 (52% of students) believe that they have to work hard for the grade, and (35%) of the same group of examined students believe that they work hard, but not as much as for other subjects. We can connect these research results with the fact that it is a subject in which children do not study much and with less effort achieve better grades, which later result in a better school average at the end of the year. (Novak, M. (2019). Did male and female students deserve the grade they received in the subject of physical and health education, it turned out that there is a statistical difference in opinion, 97.33% of the students believed that they deserved the grade they received. Although the abilities of the students are not the only criteria for evaluating students in physical and health culture, the trend of declining ability is in collision with student grades (Tomac, Z., Šumanović, M., Rastovski, D. (2013) Gontarev, Seryozha and Kalač (2017) in their research found that Absence from classes is related to the release of students from physical education.

Rayan, Corvile-Smit, Adams, and Delicandro (1998) state that research results related to gender are inconsistent, so the authors did not find statistically significant differences in absenteeism between boys and girls.

Tolić (1980) in his research on the absence of secondary school students from physical and health education classes proves that there is no difference in the total number of absences between male and female student populations.

CONCLUSION

Male and female students at primary schools from grades VI to IX in the Ilijaš municipality consider that the subject of physical education and health is important, and they evaluate it as a useful,

understandable, and interesting subject for current life. One of the confirmed assumptions is that students attend physical and health language classes more than other subjects, where mathematics and BHS language subjects were used for comparison, where the number of absences is visibly higher. The reason for this can be found in the fact that students feel less pressure in physical and health language classes, and that this type of teaching represents a less stressful pace compared to the subjects of mathematics and BHS language. We can say that more attention should be paid to situations in the school environment, lessons that should be more interesting, teacher evaluation criteria, and also some extracurricular activities, which would make students' free time meaningful and organized. Students would drop out less if they felt important and felt the possibility for their development and progress. Considering that our research showed that teachers of other subjects do not attach enough importance to physical and health education, it is necessary to educate other teachers about the importance of this subject. The results confirm that the problem of school absenteeism must be treated as a complex phenomenon that should be approached in a multidisciplinary manner. A proposal that can be implemented to reduce the number of absences from Physical and Health Education classes can be reflected in the fact that students are interactively presented with the benefits they receive from physical and health education, and how many complications obesity and the diseases, it brings with it create for the human body, it is necessary for cooperation with colleagues from other teaching subjects, to achieve cooperation so that the value of the subject of physical and health education is not reduced, which is currently the practice in many environments.

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THE TREND OF SPEED AND AGILITY DEVELOPMENT IN FOOTBALL PLAYERS

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ABSTRACT: With the aim of determining the trend of development of speed and agility in soccer players, the results of the research conducted on a sample of 68 soccer players aged 12 to 16 were analyzed. The research is transferal in nature, i.e. the results were obtained by measuring the investigated variables at one time point for soccer players aged 12, 13, 14, 15 and 16 years. Two variables from the space of morphological characteristics were measured on the tested sample, three variables for speed assessment and one variable for agility assessment. Based on the results of the central and dispersion parameters and the comparison of the arithmetic means of the variables for evaluating speed and agility in football players of different ages, we can see that the results of the 5 m sprint variable indicate that the lowest average value was in football players aged 13 (1.27 m/s), while the positive growth trend is 5-meter sprint from 12, 14 to 16 years (1.22>1.24>1.13>1.10 m/s). The 10 m sprint variable has the same values at 12 and 14 years old (2.04 m/s), and the growth trend continues at 15 and 16 years old (1.90>1.86 m/s), and the smallest sprint value at 5 m was with a 13-year-old football player. By analyzing the variable that explains the 20-meter sprint, we can see that the results show a negative trend of sprint development. Soccer players aged 14 had the best average score, followed by soccer players aged 12, then 13, and players 15 and 16 had the lowest values. The variable for the assessment of agility (zig zag without ball) has the lowest average value in thirteen-year-olds (6.39 m/s), while there is a positive growth trend from 12, 14 to 16 years (6.21>6.14>6.10> 5.98 m/s).

Keywords: *nogomet, trend, brzina, agilnost*

INTRODUCTION

Football is one of the complex sports in which achieving good results depends on multiple interconnected factors (Stølen T., Chamari K., Castagna C., 2005; Bangsbo, J. & Krstrup, P., 2009). Football belongs to the group of polystructural acyclic movements and is one of the most complex sports today (Dujmović, 1997). The complexity of football is reflected in the demands placed on the players, both technical and tactical, during which the distance that the players cover during the game should be considered, while applying different forms of movement, from walking, jumping, kicking, duels, handling the ball, to sprints, all performed at different intensities. In an effort to determine the abilities that are most important for success, the fact is that the research must begin by determining the laws that appear by analyzing the movement itself during the game, and then the analysis of the basic physiological indicators that can be monitored during the game is extremely important (Dujčić, 2019). Soccer is the most popular sport in the world, with higher and greater demands on the players' motor skills and ability to provide energy, as well as the use of faster and more efficient techniques and tactics (Sporiš et al., 2012). Since soccer players constantly change their movement speed during the game, it is necessary to break down the total distance traveled during the match into certain categories, in relation to the speed (intensity) of movement (Di Salvo et al., 2006; Barros et al., 2007; Lago et al. et al., 2010). Speed is an almost entirely disposition-type ability. Most of the authors who researched speed for this ability determined the innateness coefficient of .95, which means that about 95% of the variability of this ability is a genetic factor, and only 5% is training. Sensitive periods of speed development are from 7 to 10 years (I phase) and from 14 to 15 years (II phase) (Gužalovski, 1984), while according to Drabik (1996) this period is from 7 to 9 years. For these

reasons, speed needs to be developed at a very early age, similar to explosive power with which it is closely related. The speed of soccer players is a complex trait made up of different anthropological abilities such as: perception speed, prediction speed, decision speed, reaction speed, cyclic and acyclic speed, action speed, action speed (Rađo et al., 2002). The football game can be described as a complex activity of an acyclic interval character. For example, during one soccer match, top soccer players of both sexes perform an average of 1,200 to 1,400 different activity changes (mostly short-term), changing them every 4–6 seconds (Čolakhodžić, E., Rađo, I., Alić, H., 2016). Agility, as a primary motor factor, is defined as the ability to quickly change the direction of movement (Gredelj et al., 1975). Sheppard and Young (2006) based on several years of research gave a definition that fast movement of the whole body with a change in speed or direction of movement in response to a stimulus is considered agility, but the movement should not only contain a change in speed or direction of movement, but must it is also an open skill, in which the reaction to the stimulus is included. Sensitive phases for the development of agility have two periods: immediately before puberty (10–13 years) and after the accelerated phase of growth and development (from 16 years onwards) (Martin, 1982). The methodology of training and development of agility should be guided by the following rules. The extreme neuromuscular demands of agility condition the application of agility exercises at the very beginning of training. Training should consist of short intervals of intense work (3-10 seconds) and appropriate rest intervals. The ideal method for developing agility is the repetitive method, and if you want to improve agile endurance, the interval method is recommended (Plisk, 2000).

METHOD

This research is a transversal study with the aim of determining the trend of development of speed and agility in football players. Assessment and testing of motor skills (speed and agility) performed at the auxiliary stadium of FK Velež. Before the testing assessment, a ten-minute warm-up was performed, which included activation and mobility exercises, stretching, light running, and acceleration exercises. The break between tests lasted 10-15 minutes. The testing was done by researchers from the Institute of Kinesiology, Faculty of Teaching, University "Džemal Bijedić" in Mostar.

A sample of respondents

The sample of respondents consisted of 68 young football players of FK Velež from Mostar, aged 12 to 16. The respondents were divided into five groups by age: 12 years (N=11), 13 years (N=11), 14 years (N=22), 15 years (N=13), 16 years (11).

Sample variables

This research included 7 variables, namely 3 variables to assess speed, 1 variable to assess agility, 2 variables to assess morphological status and one to assess age. The basic variables used in the work are: AGE - age (years), Body height (cm), Body mass (kg),

Sprint 5 meters (m/s), Sprint 10 meters (m/s), Sprint 20 meters (m/s), zig zag without the ball (m/s).

Data processing methods

The obtained results were processed in the statistical package SPSS (version 26.0; SPSS, Inc., Chicago, IL, USA). Central and dispersion parameters were calculated for each applied variable. The normality of the distribution of the results was examined on the basis of the skewness coefficient and the elongation coefficient (Kurtosis).

RESULTS AND DISCUSSION

Table 1 shows measures of central tendency, measures of variability, and measures of deviation in 11 soccer players aged 12 years. The research included soccer players with an average height of 163.18 ± 5.91 cm, of which the shortest soccer player was 155 cm and the tallest 174 cm, and the range between the minimum and maximum score was 19 cm, while the average mass was 49.82 ± 6.15 kg. In the variables that determine the speed, the average speed at 5 meters was $1.22 \pm .09$ m/s., at 10 meters it was $2.04 \pm .09$ m/s., while at 20 meters the average speed was $2,99 \pm .19$ m/s. In the variable that explains agility, the average values achieved by soccer players were $6.21 \pm .20$ m/s.

Table 1. – Central and dispersion parameters of football players aged 12 years

Variables	N	Min.	Max.	Mean	Std.Dev.	Skew.	Kurt.
age	11	12,00	12,00	12,0000	12,00		
height (cm)	11	155,00	174,00	163,18	5,91	,33	-,54
weight (kg)	11	43,00	62,60	49,82	6,15	,91	,24
Sprint 5m (m/s)	11	1,11	1,40	1,22	,09	,45	-,48
Sprint 10m (m/s)	11	1,90	2,19	2,04	,09	,14	-1,05
Sprint 20m (m/s)	11	2,74	3,33	2,99	,19	,28	-,87
zigzag without ball (m/s)	11	5,99	6,58	6,21	,20	,60	-1,15

Table 2 shows the results of central and dispersion parameters in 11 soccer players aged 13 years. Soccer players of this age had an average height of 164.63 ± 5.04 cm, of which the shortest soccer player was 158 cm, and the tallest 174 cm, and the range between the minimum and maximum score was 16 cm, while the average mass was 52.66 ± 4.21 kg. In

the variables that determine the speed, the average speed at 5 meters was $1.27 \pm .09$ m/s., at 10 meters it was $2.11 \pm .10$ m/s., while at 20 meters the average speed was $3,10 \pm .19$ m/s. In the variable that explains agility, the average value achieved by soccer players was $6.39 \pm .14$ m/s.

Table 2. - Central and dispersion parameters of soccer players aged 13 years

Variables	N	Min.	Max.	Mean	Std. Dev.	Skew.	Kurt.
age	11	13,00	13,00	13,00	,00		
height (cm)	11	158,00	174,00	164,63	5,04	,40	-,66
weight (kg)	11	47,50	61,30	52,66	4,21	,87	,56
Sprint 5m (m/s)	11	1,11	1,39	1,27	,09	-,37	-1,36
Sprint 10m (m/s)	11	1,90	2,24	2,11	,10	-,77	-,21
Sprint 20m (m/s)	11	2,82	3,45	3,10	,19	,14	-,94
zigzag without ball (m/s)	11	6,08	6,62	6,39	,14	-,51	1,06

Table 3 shows measures of central tendency, measures of variability, and measures of deviation in 22 soccer players aged 14 years. The average height of soccer players was 170.50 ± 7.56 cm, of which the shortest soccer player was 159 cm and the tallest 185 cm, and the range between the minimum and maximum score was 26 cm, while the average mass

was 54.77 ± 8.15 kg. In the variables that determine speed, the average speed at 5 meters was $1.24 \pm .09$ m/s., at 10 meters it was $2.04 \pm .11$ m/s., while at 20 meters the average speed was $2.92 \pm .12$ m/s. In the variable that explains agility, the average value achieved by soccer players was $6.14 \pm .13$ m/s.

Table 3. - Central and dispersion parameters of football players aged 14 years

Variables	N	Min.	Max.	Mean	Std. Dev.	Skew.	Kurt.
age	22	14,00	14,00	14,00	,00		
height (cm)	22	159,00	185,00	170,50	7,56	,15	-1,05
weight (kg)	22	39,90	70,30	54,77	8,15	,39	-,57
Sprint 5m (m/s)	22	1,01	1,40	1,24	,09	-,81	,46
Sprint 10m (m/s)	22	1,75	2,23	2,04	,11	-,44	,33
Sprint 20m (m/s)	22	2,58	3,18	2,92	,12	-,48	1,71
zigzag without ball (m/s)	22	5,79	6,35	6,14	,13	-,75	,99

By analyzing table 4, where the results of the central and dispersion parameters of 13 soccer players aged 15 are shown, we can see that the average height of the soccer players is 180.53 ± 9.59 cm, of which the shortest soccer player was 168 cm, and the tallest 194 cm, and the range between the minimum and maximum results was 26 cm, while the average mass

was 68.19 ± 8.16 kg. In the variables that determine the speed, the average speed at 5 meters was $1.13 \pm .09$ m/s., at 10 meters it was $1.90 \pm .11$ m/s., while at 20 meters the average speed was $3.27 \pm .16$ m/s. In the variable for assessing agility, the average values achieved by soccer players were $6.10 \pm .29$ m/s.

Table 4. - Central and dispersion parameters of football players aged 15 years

Variables	N	Min.	Max.	Mean	Std. Dev.	Skew.	Kurt.
age	13	15,00	15,00	15,00	,00		
height (cm)	13	168,00	194,00	180,53	9,59	-,04	-1,66
weight (kg)	13	51,70	78,70	68,19	8,16	-,61	-,48
Sprint 5m (m/s)	13	,98	1,26	1,13	,09	-,16	-1,10
Sprint 10m (m/s)	13	1,69	2,07	1,90	,11	-,43	-,12
Sprint 20m (m/s)	13	3,00	3,63	3,27	,16	,18	1,00
zigzag without ball (m/s)	13	5,68	6,57	6,10	,29	,22	-1,22

Table 5, which tells about the results of the central and dispersion parameters for 11 soccer players, aged 16, who had an average height of 178.81 ± 5.23 cm, of which the shortest soccer player was 171 cm, and the tallest 186 cm, and the range between the minimum and the maximum result was 15 cm, while the average weight was 70.87 ± 6.49 kg. In the

variables that determine speed, the average speed at 5 meters was $1.10 \pm .07$ m/s., at 10 meters it was $1.86 \pm .07$ m/s., while at 20 meters the average speed was $3.17 \pm .11$ m/s. In the variable that explains agility, the average values achieved by soccer players were $5.98 \pm .33$ m/s.

Table 5. - Central and dispersion parameters of soccer players aged 16 years

Variables	N	Min.	Max.	Mean	Std. Dev.	Skew.	Kurt.
age	11	16,00	16,00	16,00	,00		
height (cm)	11	171,00	186,00	178,81	5,23	-,16	-1,34
weight (kg)	11	62,80	83,20	70,87	6,49	1,00	,35
Sprint 5m (m/s)	11	,98	1,20	1,10	,07	-,55	-,72
Sprint 10m (m/s)	11	1,74	1,97	1,86	,07	-,45	-,98
Sprint 20m (m/s)	11	3,00	3,42	3,17	,11	,96	1,03
zigzag without ball (m/s)	11	5,52	6,53	5,98	,33	,109	-1,28

Table 6 shows a comparison of arithmetic means of variables for assessing speed and agility in soccer players of different ages. Based on the obtained results, we can see that the variable sprint 5 m, the lowest average value was achieved by thirteen-year-olds (1.27 m/s), while the positive growth trend is from 14, 12 to 16 years (1.24>1.22>1, 13>1.10 m/s). The 10 m sprint variable has the same values at 12 and 14 years old (2.04 m/s), and the growth trend continues at 15 and 16 years old (1.90>1.86 m/s), and the smallest sprint value at 5 m was with a 13-year-old football player. By analyzing the variable that explains the 20-meter sprint, we can see that the results show a negative trend of sprint development. Soccer players aged 14 had the best average score, followed by soccer players aged 12, then 13, and players 15 and 16 had the lowest values. The variable for the assessment of agility (zig zag without ball) has the lowest average value in thirteen-year-olds (6.39 m/s), while there is a positive growth trend from 12, 14 to 16 years (6.21>6.14>6.10> 5.98 m/s). All the facts, a large number of studies confirm that

the modern soccer game places great demands on soccer players. For this reason, young players must be continuously exposed to effective training stimuli in order to provide their maximum when it is most expected of them - in the senior category (Reilly, 2005). However, creating top soccer players is a long-term process that includes the identification, selection and development of talent (Reilly et al., 2000). The identification and development of young footballers have therefore become very important for most top teams. (Williams and Reilly, 2000). Numerous variables are taken into account when it comes to selecting the best young soccer players, and all of them are evaluated with the help of numerous laboratory and field test procedures. In addition, the importance of testing is reflected in the evaluation of anthropological characteristics and the assessment of the effectiveness of the training process. Probably the most important task of permanent monitoring is the selection of young players and noting the development of these categories of football players over a long period of time. (Stojanović, 2008).

Table 6. - Comparison of the arithmetic means of the tested variables

Variables	12 GOD.		13 GOD.		14 GOD.		15 GOD.		16 GOD.	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
age										
height (cm)	163,18	5,91	164,63	5,04	170,50	7,56	180,53	9,59	178,81	5,23
weight (kg)	49,82	6,15	52,66	4,21	54,77	8,15	68,19	8,16	70,87	6,49
Sprint 5m (m/s)	1,22	,090	1,27	,09	1,24	,09	1,13	,09	1,10	,07
Sprint 10m (m/s)	2,04	,09	2,11	,10	2,04	,11	1,90	,11	1,86	,07
Sprint 20m (m/s)	2,99	,19	3,10	,19	2,92	,12	3,27	,16	3,18	,14
zigzag without ball (m/s)	6,21	,20	6,39	,148	6,14	,13	6,10	,29	5,98	,33

CONCLUSION

This paper presents the results of the trend of speed and agility in 68 young soccer players. The results of the statistical analysis show that the variables for assessing speed and agility in most of the tested groups have a continuous development. In addition to the fact that football is the most popular sport in the world and regardless of the fact that it is played by everyone, children, women, young and old, the greatest attention of the world's sports until now, science has focused on top teams and soccer players. That is why little is known about the effects of football on the motor skills and morpho-functional characteristics of young people. The obtained results are on a descriptive level and are in accordance with previous research, while the analysis on a comparative level between categories was absent because it concerns young football players, where the period during, before and after puberty differentiates young athletes in many ways. Research in this direction would lead to new and clearer knowledge that would facilitate the selection process of young football players.

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EFFECTS OF A THREE-MONTH PROGRAM ON SWIMMING SPEED WITH THE DOLPHIN TECHNIQUE

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ABSTRACT: The main goal of the research is to determine the effects of the three-month program on swimming speed of the dolphin technique. The swimmer in the water is in an unstable position, without firm support, which contributes to the characteristic phenomenon of weight loss, since the weight of the body is neutralized by the thrust of the water. This neutral position allows the swimmer to move with the locomotor apparatus at different intensities, without major problems and static stresses, which contributes to the harmonious development of the body (especially significant at a younger age). The sample of respondents consisted of the Association of Sports and Health "Sportivo" Sarajevo, aged 10-12 years, male. The sample of respondents for this research was 44 swimmers, clinically and psychologically healthy and without significant morphological and locomotor impairments. The research was conducted at the regular training sessions of the Sports and Health Association "Sportivo" Sarajevo at the Otoka Olympic Pool, Sarajevo. Sample of variables The selection of variables for this research was made on the basis of their measurement characteristics: validity, reliability, sensitivity, economy and adaptability and appropriateness to the age of the respondents. To evaluate the parameters of the speed of swimming with the dolphin technique: Speed of swimming at 25m with the dolphin technique - BPDT25, Speed of swimming at 50m with the dolphin technique - BPDT50 and Speed of swimming at 100m with the dolphin technique - BPDT100. In order to have a wider application, it is necessary to make additional corrections and improvements. Which means for some more significant changes in the applied variables, the content of the applied program should be additionally programmed to cause even more qualitative changes in the variables.

Keywords: *swimming, dolphin, effects*

INTRODUCION

Swimming is the ability to keep the body on the water and the ability to move through the water with adequate movements of the hands, legs and body (Madić, D., Okičić, T. and Aleksandrović, M. 2007). Due to the environment in which it takes place, swimming has special characteristics and specificities that significantly affect the morphological, functional, biomotor, psychological and intellectual development of the personality. The goal of training processes in swimming is to make appropriate positive metabolic, physiological and psychological changes in the swimmer's body, which will enable the achievement of the best competitive results (Maglischo, 2003). The swimmer in the water is in an unstable position, without firm support, which contributes to the characteristic phenomenon of weight loss, since the weight of the body is neutralized by the thrust of the water. This neutral position allows the swimmer to move with the locomotor apparatus at different intensities, without major problems and static stresses, which contributes to the harmonious development of the body (especially significant at a younger age). Swimming burns a large number of calories, from 500 to 650, depending on the intensity of swimming. In addition to strengthening the chest muscles, one hour of breaststroke swimming can burn up to 750 calories, 30 minutes of crawl swimming around 350 calories, one hour of butterfly (dolphin) swimming around 800 calories, while backstroke burns around 500. calories per hour (Trivun, M., et al. 2013). Swimming is an activity that has a positive effect in terms of developing boldness, courage, resilience and perseverance. Swimming can have significant preventive-corrective and therapeutic effects on a

young child's body (Topuzov, I. 1999). The effect of swimming on heart health is as follows: swimming activates every muscle in the body, including the most important one - the heart. Swimming strengthens the heart and pumps blood more efficiently, thus improving circulation in the body. Swimming increases and strengthens the muscles of the heart, stabilizes blood pressure, improves the supply of oxygen to the heart and lungs, deepens breathing and increases lung capacity (Budimir, V. et al. 2010). Authors Chengalur & Brown, 1992; Hout-Marchand et al., 2005; Jorgić et al., 2010 tried to determine the parameters of situational motor skills that most affect the result in certain swimming disciplines and which should then be perfected. Research was done on the influence of individual segments of the race on the final result in swimming (starting swimming speed, turning speed and final speed) and it was established that the improvement of swimmers' performance is influenced by all three components of the race, and not just one of them (Thompson et al., 2004).). The main goal of the research is to determine the effects of the three-month program on swimming speed of the dolphin technique.

RESEARCH METHODS

A sample of respondents

The sample consisted of the Association of Sport and Health "Sportivo" Sarajevo, aged 10-12 years, male. The sample of respondents for this research was 44 swimmers, clinically and psychologically healthy and without significant morphological and locomotor impairments. The research was conducted at the regular training sessions of the Sports and Health

Association "Sportivo" Sarajevo at the Otoka Olympic Pool, Sarajevo.

Sample variables

The choice of variables for this research was made on the basis of their measurement characteristics: validity, reliability, sensitivity, economy and adaptability and appropriateness to the age of the respondents according to Mirvić, E., (2011).

To estimate swimming speed parameters using the dolphin technique:

1. Swimming speed at 25m using the dolphin technique – BPDT25,
2. Speed of swimming at 50m using the dolphin technique - BPDT50,
3. Swimming speed for 100m using the dolphin technique – BPDT100.

Procedure

To ensure the regularity of this research process during planning, consents from the following institutions and individuals were used: Assistance of experts in the field of sports and physical education (verified trainers) in the implementation of the project; The decision of the Sports and Health Association "Sportivo" Sarajevo that this project can be tested and realized as part of the regular training of the club of the same name; Approval and confirmation that testing was done at the Otoka Olympic Pool, Sarajevo; All subjects had the same conditions during measurement and testing (the entire research was carried out in the morning hours, from 8 to 9:30 a.m., the temperature was from 24 to 26 degrees Celsius, the place of testing was the Otoka Olympic pool, Sarajevo; equipped with the necessary props); Before the measurement and testing process, the swimmers of the Association of Sports and Health "Sportivo" were explained in an acceptable way what awaits them during the period of the research and what is required of them in their work; The measurement was performed in 4 groups of 11 swimmers; A measurer and recorder worked at each measuring point; The team of measurers consisted of professors/masters of sports and physical education and coaches of swimming clubs who were familiar with the research project, measurement lists and how to fill them in; The swimmers of the Sports and Health Association "Sportivo" were divided into four groups, each group implemented a program with a different sequence of sports technique training for a period of 3 months. Initial testing will be done, then a three-month program will be implemented and finally the final testing will be done.

Data processing methods

In the process of data processing, based on the characteristics and size of the sample, the subject, the problem and the goal of the research, statistical methods were determined for obtaining results in the research. Using descriptive statistical methods

from the SPSS 12.0 program, we will determine the basic parameters that characterize the sample: Min., minimum value, Max., maximum value, Rank, range, Sum., summary, Median, median, Mean, arithmetic mean, Std. Dev., standard deviation, Error, standard error, Variance, coefficient of variation. The normality of the distribution of variables will be examined based on the coefficient: Skewness, curvature, Kurtosis, elongation coefficient. Differences will be determined by the T-test for dependent samples.

RESULTS

Central and dispersive parameters of the variables for the evaluation of swimming speed using the dolphin technique in the initial state.

By looking at table number 1, descriptive statistical methods were used to process the data, where it can be observed that in all variables there is no significant deviation from the normal distribution. The distributions of the subjects' abilities fit into the standards specific to the speed of swimming with the dolphin technique of boys aged 10 to 12 years and if this population is in the process of constant transformation resulting from the influence of the specific age of the subjects. Therefore, there are no significant deviations in the distribution of the results from the normal distribution for the dolphin swimming technique, which we can see from the presented table, where the current situation can generally be determined.

The presented situation can be explained by the following arguments: the specifics of the population used in the work (the Association of Sport and Health "Sportivo" aged 10 to 12 years, who were under the influence of the specific plan and program that was applied at the training sessions of the Association of Sport and of health "Sportivo")

By individual review and analysis of the variables, we can determine the following:

Dolphin swimming speed at 25 meters - BPDT25 - the arithmetic mean is (MEAN is 19.9691), the range (MIN. - MAX.) is from 16.13 to 24.80 and the standard deviation (STD. DEV.) is 2.88583.

Dolphin swimming speed at 50 meters - BPDT50 - the arithmetic mean is (MEAN is 47.4666), the range (MIN. - MAX.) is from 39.72 to 60.19 and the standard deviation (STD. DEV.) is 5.06103.

Swimming speed using the dolphin technique at 100 meters - BPDT100 - the arithmetic mean is (MEAN is 106.8186), the range (MIN. - MAX.) is from 95.50 to 125.57 and the standard deviation (STD. DEV.) is 9.32886.

By looking at table no. 1 it can be determined that a normal distribution has occurred.

Central and dispersive parameters of the variables for the evaluation of swimming speed using the dolphin technique in the final state.

Reviewing table no. 2 it can be seen that in the final measurement used in this research, it can be stated that there is no significant deviation from the normal distribution. The distributions of the respondents'

abilities fit the standards specific to the specified area. So, there are no significant deviations in the distribution of the results from the normal distribution

for some of the mentioned variables. We can see this from the presented table, where the current situation can generally be determined.

Table 1. Central and dispersive parameters of the efficiency of the program of swimming at the speed of swimming with the dolphin technique in the initial state

Descriptive Statistics												
Variables	N	Range	Min	Max	Mean		Std. Dev.	Variance	Skew,		Kurt.	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BPDT25	44	8.67	16.13	24.80	19.969	.43505	2.88583	8.328	.074	.357	-1.780	.702
BPDT50	44	20.47	39.72	60.19	47.466	.76298	5.06103	25.614	.535	.357	-.223	.702
BPDT100	44	30.07	95.50	125.57	106.818	1.40638	9.32886	87.028	1.152	.357	-.121	.702

Table 2. Central and dispersive parameters of the efficiency of the program of swimming at the speed of swimming with the dolphin technique in the final state

Descriptive Statistics												
Variables	N	Range	Min	Max	Mean		Std. Dev.	Variance	Skew.		Kurt.	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
BPDT25	44	9.21	15.19	24.40	17.477	.38215	2.53490	6.426	1.883	.357	2.217	.702
BPDT50	44	23.93	35.16	59.09	44.941	.89216	5.91793	35.022	.738	.357	.044	.702
BPDT100	44	31.13	90.33	121.46	101.602	.92253	6.11938	37.447	.034	.357	1.677	.702

Individual review and analysis of the variables can determine the following:

Speed of swimming with the dolphin technique at 25 meters - BPDT25 - the arithmetic mean is (MEAN is 17.4777), the range (MIN. - MAX.) is from 15.19 to 24.40 and the standard deviation (STD. DEV.) is 2.53490

Speed of swimming with the dolphin technique at 50 meters - BPDT50 - the arithmetic mean is (MEAN is 44.9416), the range (MIN. - MAX.) is from 35.16 to 59.09 and the standard deviation (STD. DEV.) is 5.91793

The speed of swimming with the dolphin technique at 100 meters - BPDT100 - the arithmetic mean is (MEAN is 101.6027), the range (MIN. - MAX.) is from 95.50 to 121.46 and the standard deviation (STD. DEV.) is 6.11938

Based on table no. 1 and table no. 2, it can be noted that there was a transformation of the results, and which specific results and how much the transformation took place will be determined in the following methods. It can be stated that the results showed mostly centroid grouping, and the results can be taken into further consideration.

Analysis of the results of the T-test of the initial and final state of the effectiveness of the dolphin speed swimming technique program T-test analysis (Table 3.) for dependent samples, evaluated the effects of the program on swimming speed using the dolphin technique. The results indicate positive and statistically significant differences in the variables in the transformation to swimming speed using the dolphin technique.

Table 3. Results of the T-test of the initial and final states of swimming speed using the dolphin technique

Variables		Paired Differences					t	df	Sig. (2-tailed)	η ²
		Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	BPDT25 - BPDT25F	2.491	2.723	.41064	1.66323	3.319	6.067	43	.000	0,22
Pair 2	BPDT50 - BPDT50F	2.525	4.368	.65861	1.19679	3.853	3.834	43	.000	0,15
Pair 3	BPDT100 - BPDT100F	5.215	8.389	1.26480	2.66519	7.766	4.124	43	.000	0,16

The differences between the initial and final testing are also statistically significant in the BPDT25 - BPDT25F tests $t(43) = 6.067$, $p = .000$. The mean decrease in value in this test was 2.491, while the 95 percent confidence interval extends from 1.663 to 3.319, $\eta^2 = 0.22$.

Statistically significant differences between the initial and final testing were found in the BPDT50 - BPDT50F tests $t(43) = 3.834$, $p = .000$. The average decrease in value in this test was 2.525, while the 95-percent confidence interval extends from 1.196 to 3.853, $\eta^2 = 0.15$.

The differences between the initial and final testing are also statistically significant in the BPDT100 - BPDT100F tests $t(43) = 4.124$, $p = .000$. The average decrease in value in this test was 5.215, while the 95-percent confidence interval extends from 2.665 to 7.776, $\eta^2 = 0.16$.

DISCUSSION

The main objective of this study was to determine the effects of the three-month program on swimming speed of the dolphin technique. It should be emphasized that the fastest progression in swimming speed was expected with the dolphin technique. Marković, V., (2012). In his research, he analyzed the variances of the dolphin technique through the buttocks of five Olympic competitions of top swimmers. Determined which values of the researched variables change the most throughout the analyzed period, namely: KREZ (final result), UBP (total swimming speed), VP50 (passing time at 50m), VOKR and VFIN (turn and finish time). Leko G., Grčić-Zubčević N. and G, Sporiš, (2006). They apply specific swimming tests on dry land and in water, which requires a good knowledge of swimming technique on the part of the examinee. The aim of the work was to examine whether the swimming results of the student population, i.e. to determine whether these standard swimming tests (dynamometry in water and swimming ergometer on dry land) can be used to measure an unselected swimming population. Only the dynamometry test measured in the water in the place proved to be a successful predictor of results on shorter sections, i.e. 25 meter crawl, 50 meter crawl and 50 meter dolphin. In the 300-meter crawl, not a single predictor stood out as significant, while in the 50-meter dolphin section, the dynamometry test 1 dolphin passage also stood out as significant. It is noted that it leads to the conclusion that the ergometry test on dry land is completely inappropriate for testing an unselected swimming population. Zenić, N. and N. Grčić-Zubčević, (2005). The sample of subjects consisted of kinesiology students, the control group was taught swimming in three heterogeneous groups that initially did not significantly differ from each other in swimming abilities. Based on the initial swimming results, the experimental group was divided into three homogenized groups (subjects with below-average, average and above-average swimming abilities) using taxonomic analysis, and swimming lessons were carried out in the groups thus formed. The sample of variables consisted of 6 variables for the assessment of swimming abilities, namely: crawl 25, 50 and 300

meters (K25, K50, K300); backstroke 50 meters (L50); dolphin 50 meters (D50) and breaststroke 100 meters (P100). Given that when working with heterogeneous groups, the same group contains subjects with extremely good and extremely poor swimming abilities, the teacher is forced to apply the contents of the work, which, considering the volume of work, are average. Given that the correct selection of load volume is the basis of progress in all abilities, including swimming, it is clear why the experimental program achieved better results than the control program. When looking at individual variables, the following can be applied: the biggest changes occurred in the variables: 25m swimming speed using the dolphin technique, 50m swimming speed using the dolphin technique and 100m swimming speed using the dolphin technique. These results indicate that continuous work on improving technique is of great importance for swimming speed. When swimming with an incorrect technique, all the negative influences of the forces in the water appear, most notably frontal resistance. By correcting and bringing the technique to all biomechanical principles for performing techniques, the resistance in the water is reduced so that swimmers gain speed. The following can be concluded: If they improved the conditions and increased the number of trainings, the result would be undeniably better, Include a greater number of different experts (physiotherapists, nutritionists, etc.), A greater number of competitions with participation in increasingly difficult competitions and Planned vacations for competitors. It should be said that the water temperature, which was from 24 to 26 degrees Celsius, had an effect on such a good level of transformation processes, because the swimmers did not lose energy to heat the water. They felt comfortable in the water, and spent a lot of time practicing the mentioned techniques, which is certainly another reason for the progress and efficiency of swimming in this research. It can be concluded that in this research there was a great influence of the swimming program on the set of variables. The reason for this is precisely that this technique is the last to be mastered and therefore at the beginning of the program swimmers are not so motorically prepared with this technique. However, this technique is the most beautiful and he likes to swim so that in the training process there is a motivation to perform the dolphin technique as correctly and quickly as possible. The age of the subjects should be taken into account, they are young swimmers aged 10 to 12, who are more suited to short sections dominated by maximum movement speed. It can be said that the respondents in this research reached their maximum speed when it comes to swimming speed using the dolphin technique at 25 meters. In the other variables of the dolphin technique, there was positive progress, and to an unexpected extent. It should be said that this is a good basis for achieving good results in older categories with the dolphin technique.

CONCLUSION

The purpose of the conducted research was to determine the effects of the three-month program on swimming speed of the dolphin technique. Twelve

tests were applied that evaluated the swimming speed of the dolphin technique. Based on the results of descriptive statistics, it could be concluded: By looking at the values of the arithmetic means of the initial and final testing, a positive shift can be observed in most variables. All variables in the initial and final measurement by descriptive statistical methods, it is possible to notice that in all variables there is no significant deviation from the normal distribution. The distributions of the subjects' abilities fit the standards specific to the speed of swimming with different techniques of boys aged 10 to 12 years, and if this population is in the process of constant transformation resulting from the influence of the specific age of the subjects. By analyzing the results of the T-test for the dependent sample, the following conclusions were reached: The following should be concluded: If the conditions were improved and the number of trainings increased, the result would undoubtedly be better. by participating in more and more difficult competitions. These results indicate that continuous work on improving technique is of great importance for swimming speed. When swimming with an incorrect technique, all the negative influences of the forces in the water appear, most notably frontal resistance. By correcting and bringing the technique to all biomechanical principles for performing techniques, the resistance in the water is reduced so that swimmers gain speed. This shows us how important it is to adopt the correct technique. The impact of the program was expected due to the fact that the biggest indicators of difference are when swimming in larger sections. Better results are achieved by improving swimming technique and eliminating negative influences. Based on the results of the applied swimming program, we can conclude that the content of the program influenced the set variables. In order to have a wider application, it is necessary to make additional corrections and improvements. Which means for some more significant changes in the applied variables, the content of the applied program should be additionally programmed to cause even more qualitative changes in the variables.

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RELATIONS BETWEEN MORPHOLOGICAL CHARACTERISTICS AND PERFORMANCE OF ELEMENTS OF BASKETBALL TECHNIQUE OF 7TH AND 8TH GRADE ELEMENTARY SCHOOL STUDENTS

Dejan Šumar, Naim Čeleš and Bojan Medvedović

ABSTRACT: The aim of this research was to determine the relations and influence of morphological characteristics on the performance of some elements of basketball technique of 7th and 8th grade elementary school students. 85 respondents, students of the 7th and 8th grade of Elementary School "Prekounje" from Bihać participated in the research.

The system for assessing the morphological status was represented by 7 variables that included all four latent spaces (longitudinal dimensionality of the skeleton, transferal dimensionality of the skeleton, volume and mass of the body, subcutaneous fat tissue), while 4 situational-motor tests were used to evaluate the success of performing elements of the basketball technique : (1. Throwing the ball with both hands against the wall and catching it for 30 seconds (BHLR30), 2. Dribbling the ball with the hand in a slalom (VLRS), 3. Throwing the ball into the basket for 30 seconds (ULK30), 4. Lay-ups for 30 seconds (PNK30).

Basic central and dispersion parameters were calculated for all variables which confirmed the normality of the distribution, and the relations between spaces were determined by using the canonical correlation analysis.

The values obtained by canonical correlation analysis indicate a medium-high correlation between morphological characteristics and situational-motor abilities. Two significant pairs of canonical factors were obtained.

Keywords: *morphological characteristics, situational-motor abilities, basketball, students, elementary school*

INTRODUCTION

Basketball has multiple effects on the body of a child and a young person, after all, Naismith created it specifically for the needs of physical education. Considering that basketball is expected to affect the harmonious development of the child's entire body (Granić & Krstić, 2006), its role in physical education is quite natural (Karalejić & Jakovljević, 2001). The ability to solve simple and complex motor tasks, and especially movement structures from sports games, largely depends on different dimensions of anthropological status (Kamberi et al., 2008). In the specification equation according to Pavlović (1977), morphological characteristics and motor abilities are of the greatest importance for success in basketball.

While in some motor situation one body type directly interferes with the implementation of the kinetic program, that same body structure in another motor situation can be extremely favorable, which can be seen in a large number of researches. The problem that appears in this connection consists in finding statistically significant relations between motor abilities and corresponding morphological characteristics, in order to verify and maintain the desired anthropological harmony, which represents one of the desired goals of teaching physical and health education in primary school and sports activities (Pejčić, 2007). Matković (1984) states that the efficient performance of tasks in basketball, considering a great number of explosive activities in the game, largely depends on the specific morphological structure of the basketball player with the dominant role of the body's muscle mass. Significant relations between morphological characteristics and the results of specific motor tests in basketball were established by other researchers (Aruković, 2008; Jašarević, 2004; Pašalić, 2003). Saratlija et al. (2007) found a significant but

moderate correlation between motor tests and morphological characteristics in their research. The highest correlation was observed in the ball throwing and wall bouncing tests with tests that indirectly represent muscle mass and chronological age. Pašalić et al. (2003) determined the interconnection of a set of variables for the assessment of longitudinal dimensionality on the accuracy of passing the ball when it comes to long and medium-long passes in their research, because their quality mostly depends on the length of the lever and the path of the thrown ball. The specific influence of lever length on shooting accuracy was determined, as well as the influence of explosive power on the jump phase of jump-shooting and lay-ups. In the research conducted by Dežman (1982), it was concluded that body height and weight have a significant positive influence on the results in the tests of throwing the ball into the basket from close range, and quick and alternating passing; while the impact on the results in the ball dribbling test in a zigzag line is negative. The author also observed a significant negative influence of fat tissue on the results in all applied situational motor tests.

The main goal of this research is to determine the relation and possible connection between morphological characteristics and situational-motor abilities through the success of performing elements of basketball technique. The subject of this research are the 7th and 8th grade elementary school students and their morphological characteristics and situational-motor abilities in basketball.

METHODS

The sample consisted of 85 students of the 7th and 8th grades of Elementary School "Prekounje" from Bihać. During the testing, the psychophysical condition of all students was at a satisfactory level.

The following variables were used to test the morphological characteristics of the respondents: 1. Body height (AVIST) 2. Foot length (ADUS) 3. Wrist diameter (ADIRZ) 4. Knee diameter (ADIKO) 5. Body weight (mass) (ATEZT) 6. Abdominal skin fold (AKNTR) 7. Upper arm skin fold (AKNNL).

The following variables were used to test the respondents' situational-motor abilities: 1. Throwing the ball with both hands against the wall and catching it for 30 seconds (BHLR30), 2. Dribbling the ball with the hand in a slalom (VLRS), 3. Throwing the ball into the basket for 30 seconds (ULK30), 4. Lay-ups for 30 seconds (PNK30).

Data processing in this research and application of statistical-mathematical procedures was done in SPSS 25. In order to test the hypothesis that the results obtained by measurement in this research are normally distributed, all manifest variables were processed with standard descriptive parameters. At the multivariate level, the connection between the spaces was determined by applying canonical correlation analysis. On the basis of these methods, information was obtained on the distribution of parameters, correlations, partial correlations and on the interrelations of variables.

RESULTS AND DISCUSSION

Table 1. Basic and central dispersion parameters of morphological characteristics

	Valid N	Mean	Standard Error	Median	Mode	Standard Deviation	Variance	Skewness	Kurtosis	Range	Minimum	Maximum
AVIST	85	161,38	0,75	162,00	163,00	6,92	47,95	0,11	-0,44	32,00	147,00	179,00
ATEZT	85	50,95	1,01	50,50	48,10	9,29	86,34	0,53	-0,02	42,00	34,20	76,20
ADUS	85	24,46	0,14	24,40	24,50	1,26	1,59	0,39	0,53	6,80	21,00	27,80
ADIRZ	85	5,11	0,04	5,10	5,10	0,33	0,11	0,03	0,51	2,00	4,10	6,10
ADIKO	85	9,25	0,06	9,30	9,40 ^a	0,55	0,30	0,28	0,15	2,90	8,00	10,90
AKNTR	85	16,90	0,83	16,00	18,00	7,67	58,83	0,40	-0,67	31,90	4,90	36,80
AKNNL	85	15,55	0,84	14,20	9,80	7,77	60,43	0,80	-0,14	33,20	3,80	37,00

a. Multiple modes exists. The smallest value is shown.

By looking at Table 1, we notice that the skewness values range from 0.03 to 0.8, which tells us that these are normally distributed empirical schedules. This is supported by the values of the mode and the arithmetic mean. In the table, we notice that the students had an average body height of 161.38 cm and a body weight of 50.95 kg. The values of kurtosis range from -0.67 to 0.53 which tells us that the curve representing the distribution of the results

shows a tendency of mild leptokurticity. On the other hand, these data tell us that the chosen tests for the assessment of morphological status are well adapted to the anthropological status of the sample of respondents who entered this research. The average results in the variables AVIST - body height and ATEZT - body weight are within the limits of the expected results for this age.

Table 2. Basic and central dispersion parameters of situational-motor abilities

	Valid N	Mean	Standard Error	Median	Mode	Standard Deviation	Variance	Skewness	Kurtosis	Range	Minimum	Maximum
BHLR30	85	17,59	0,60	19,00	20,00 ^a	5,54	30,70	-0,72	0,32	27,00	1,00	28,00
VLRS	85	12,18	0,30	11,60	11,10 ^a	2,72	7,40	1,02	1,20	14,00	7,40	21,40
ULK30	85	4,08	0,30	3,00	2,00	2,74	7,53	1,18	0,98	11,00	1,00	12,00
PNK30	85	1,55	0,15	1,00	1,00	1,37	1,87	0,86	0,11	5,00	0,00	5,00

a. Multiple modes exists. The smallest value is shown.

Table 2 shows the results of the descriptive statistics of the respondents in situational-motor abilities. Skewness values indicate a slight asymmetry in both sides, but it is within normal limits. A slightly higher homogeneity of results was observed in the VLRS test - dribbling the ball with the hand in a slalom,

as indicated by the kurtosis values (1.20). Based on the obtained parameters, we can conclude that the tests for assessing situational-motor abilities are appropriate for the age of the respondents and their situational-motor abilities.

Table 3. Matrix of morphological characteristics intercorrelations

	AVIST	ATEZT	ADUS	ADIRZ	ADIKO	AKNTR	AKNNL
AVIST	1	0,473	0,591	0,405	0,443	-0,135	-0,185
ATEZT	0,473	1	0,365	0,487	0,743	0,666	0,593
ADUS	0,591	0,365	1	0,517	0,556	-0,008	-0,021
ADIRZ	0,405	0,487	0,517	1	0,595	0,245	0,177
ADIKO	0,443	0,743	0,556	0,595	1	0,444	0,421
AKNTR	-0,135	0,666	-0,008	0,245	0,444	1	0,843
AKNNL	-0,185	0,593	-0,021	0,177	0,421	0,843	1
Level of significance p=0.01							
Level of significance p=0.05							

The interrelationship of the applied variables of morphological characteristics was analyzed within the matrix of intercorrelations shown in table 3. The matrix of intercorrelations obtained on the basis of the variables of morphological characteristics contains correlation coefficients (connections) of those characteristics. Correlation coefficients indicate only the connection between variables, but not the influence of one on the other. The significance of the correlation coefficient was determined at the level of $p=.05$ and $p=.01$.

At first glance, we can see the connection within the treated variables. A good part of applied morphological variables shows high, moderate, low and insignificant correlation. There is a high correlation and strong connection between the variables for the assessment of skin folds (AKNTR and AKNNL) and it is .843. We could have expected such high correlation coefficients between these two variables because they belong to the same hypothetical factor. There is also a high correlation between the variables of body weight (ATEZT) and knee diameter (ADIKO) and it is .743. The variables for assessing the circular dimensionality are highly correlated with the variables for assessing the amount of subcutaneous fat tissue or body adiposity (ATEZT, AKNTR) .666 and (ATEZT, AKNNL) .593. By examining the correlation coefficients, we can see the connection between the variables that define the latent space of transferal dimensionality (ADIKO and ADIRZ) .595. A high correlation between the variables defining the latent space of longitudinal dimensionality (AVIST and ADUS) .591 was to be expected for this sample of respondents.

Table 4. Matrix of situational-motor abilities intercorrelations

	BHLR30	VLRS	ULK30	PNK30
BHLR30	1	-0,488	-0,418	-0,343
VLRS	-0,488	1	-0,512	-0,425
ULK30	0,418	-0,512	1	0,534
PNK30	0,343	-0,425	0,534	1
Level of significance p=0.01				
Level of significance p=0.05				

Table 4 shows the correlation coefficients of the variables for the assessment of specific basketball motor skills, that is, the intercorrelation between the results of the tests for the assessment of situational-motor abilities. The coefficients of

intercorrelations in the correlation matrix range from 0.343 to 0.534. All variables have a moderate correlation (an important connection). Through the analysis of the intercorrelation matrix, the existence of statistical significance in the crossing of variables was determined, which undoubtedly tells us that the applied battery of tests covers well the area of specific basketball motor skills, i.e. situational-motor abilities. The variables ULK30 - Throwing the ball into the basket for 30 seconds and PNK30 - Lay-ups for 30 seconds (.534) have the highest correlation, which is expected because the successful performance of these activities requires a well-developed kinesthetic sense.

Table 5. Canonical correlation coefficients of morphological characteristics and situational-motor abilities

	Canonic R	R-sqr.	Chi-sqr.	df	p	Lambda
0	,572100	,327299	65,73749	28	,000073	,430508
1	,531258	,282235	34,81407	18	,010004	,639970
2	,310382	,096337	8,94823	10	,537037	,891615
3	,115465	,013332	1,04691	4	,902599	,986668

Table 6. Matrix of the structure of isolated canonical factors in the space of morphological characteristics

	Root 1	Root 2
AVIST	,909379	,070373
ATEZT	,569520	-,202697
ADUS	,675120	,554695
ADIRZ	,487585	-,008755
ADIKO	,364059	,351459
AKNTR	,017080	-,172410
AKNNL	-,145985	-,267499

Table 7. Matrix of the structure of isolated canonical factors in the space of situational-motor abilities

	Root 1	Root 2
BHLR30	,926411	-,240721
VLRS	-,366719	-,319354
ULK30	,657416	,734665
PNK30	,434432	,506359

Table 8. Cross-correlation matrix of morphological characteristics and situational-motor abilities

	BHLR30	VLRS	ULK30	PNK30
AVIST	,482494	-,236305	,373433	,230669
ATEZT	,269975	,085927	,142048	,040415
ADUS	,275246	-,204683	,474973	,293999
ADIRZ	,268736	-,123392	,174496	,145076
ADIKO	,101960	-,002119	,281877	,138255
AKNTR	-,007170	,145904	-,062839	-,044602
AKNNL	-,087637	,204633	-,151138	-,156266

By using canonical correlation analysis of morphological characteristics and motor abilities, two pairs of significant canonical factors were isolated, and the results are presented in table number 5.

The value of the canonical correlation coefficient of 0.57 ($R = .572100$) and the amount of common variance of 33% ($R_{sq} = .327299$) of the first pair of canonical factors indicate the existence of a medium-high correlation between morphological and motor variables. The mentioned correlation is significant at a stricter level of $p = 0.01$.

By analyzing the matrix of the structure of the first isolated canonical factor in the space of morphological characteristics (Table 6), we notice that the variables for assessing the longitudinal dimensionality of the skeleton have the greatest projection on the first canonical factor. AVIST – body height has a very high correlation with the first canonical factor in the space of morphological characteristics (.91). The variable ADUS – foot length (.68) has a somewhat lower, but still high, projection on the first canonical factor. The variables ATEZT – body weight (.57) and ADIRZ – wrist diameter (.49) have medium intensity values of the connection with the first canonical factor.

By analyzing the matrix of the structure of the first isolated canonical factor in the space of situational-motor abilities (Table 7), we see that the variable BHLR30 – throwing and catching the ball for 30 seconds (.93) has an extremely high projection on the first canonical factor. The structure of the test with which we assessed this situational-motor ability is such that its structure is made up of movements that are under the control of movement regulation mechanisms that are mostly represented in the basketball game as well.

The canonical correlation between the second pair of canonical dimensions is also moderately high at 0.53 ($R = .531258$) and is explained by 28% of the common variability ($R_{sq} = .282235$) and is significant at the milder criterion of $p = 0.05$ ($p = .010004$).

By analyzing the matrix of the structure of the second isolated canonical factor in the space of morphological characteristics (Table 6), we notice that the variable ADIKO – knee diameter (.35) has a projection on the second canonical factor, which we can attribute to the specifics of the sample of respondents, measurement error and an unknown connection.

By analyzing the matrix of the structure of the second isolated canonical factor in the space of situational-

motor abilities (Table 7), we can see that the variable ULK30 – throwing the ball into the basket for 30 seconds (.73) has a high projection on the second canonical factor. A slightly lower, medium-high projection on the second canonical factor has the variable PNK30 - lay-ups for 30 seconds (.51).

By looking at the cross-correlation matrix of morphological characteristics and situational-motor abilities (Table 8), we notice that the variables AVIST - body height and BHLR30 - throwing and catching the ball for 30 seconds have the highest correlation (.48). The variables ADUS - foot length and ULK30 - throwing the ball into the basket for 30 seconds have a slightly lower correlation (.47).

CONCLUSION

The main goal of this research was to determine the relations between morphological characteristics and motor abilities with the success of performing elements of basketball technique. The sample of respondents in this research consisted of 85 students of the 7th and 8th grades of Elementary School „Prekounje“ from Bihać. 7 variables from the set of tests for the assessment of morphological characteristics were used for the assessment of morphological characteristics, and 4 variables from the set of tests for the assessment of situational-motor abilities were used for the assessment of the success of performing elements of basketball technique. Basic central and dispersion parameters were calculated for all variables, and relations between spaces were determined using canonical correlation analysis. Canonical correlation analysis was used to determine the relations between morphological characteristics and situational-motor abilities, and the obtained results indicate a high correlation between morphological characteristics and situational-motor abilities. Two significant pairs of canonical factors were obtained. According to the obtained results, morphological characteristics in students have a medium-high correlation with situational-motor abilities. This proved that morphological characteristics are important for the performance of tasks in situational-motor tests, and that they indirectly affect the efficiency of the participants of the basketball game.

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SINGING GAMES AND THEIR APPLICATION IN THE IMPLEMENTATION OF ELEMENTARY GAMES

Dženana Imamović-Turković and Faris Rašidagić

ABSTRACT: Considering play has been an important part of a child's growth since ancient times and is present from the earliest environment age. The goal of the research was to determine what singing games are, their impact on child development, and their application in the teaching of physical and health education. We will determine the influence of music on man, song, and singing, and the impact of information technology on child development. The sample consisted of 123 respondents including children and parents. Through a survey, they obtained data on the prevalence of singing games in children of preschool and school age and how much they are represented in the parents' upbringing. We compared the representation of games with singing in children who spend time in school or kindergarten and in children who spend their free time with their parents. We also compared how many singing games are represented among the children of the "modern age" and how much they were represented among their parents. Surveying looked back on the issue of the use of technology, and we compared how much, in their games, children use some of the technology concerning the use of technology in the upbringing of parents., in this work, we determined what role the game has on the social, linguistic and psychomotor development of the child. We found out how games with singing affect the growing up, learning, and development of the child. When we talk about games with singing in physical and health education, we will show how and in which parts of the lesson one can be implemented. The results of the surveys are graphically displayed and explained. In this research, the largest percentage of children, 52%, is 5-10 years old, 2-5 years old 30.9%, and 0-2 years old 17.1%. We also found that both children and parents spent most of their childhood time with their parents or someone else. We concluded that 39% of children spend 1-2 hours using some form of technology and even 32.5% spend more than 2 hours with a mobile phone, computer, or television. We obtained the information that 68.3% of children play games with singing, while the percentage with the parents is significantly higher and amounts to 93.5% When it comes to the children's feelings after the game, we obtained data that both children (90.2%) and parents (94.3%) felt joyful and satisfied. Research with the same or similar variables should be organized and conducted with different age categories.

Keywords: *games, music, singing, technology.*

INTRODUCTION

Play is a phenomenon of childhood and marks the children's culture. The game is a mirror of what is important to the child. The child also enjoys playing, having fun, making, and choosing activities. Can be played at home or away from home. The child plays for different reasons. A game can be defined as any game an activity that the child chooses on his own as a consequence of enjoyment and satisfaction. (Lindon, 2001). It's a game children practice, free action that is outside ordinary real life. (Rajić and Petrović-Sočo, 2015). The game, especially the social one that includes social interactions, developmental psychologists point out. The importance of play for the overall development of a child is unquestionable, therefore the game is the focus of much research. Early theorists and contemporaries are fascinated by how children play, how they learn social interactions with peers, both creativity and imagination they enrich the game, how children learn to share and how give up (Klarin, Psychology of children's play 2017). Play is a basic biological drive, it is an integral part of our health, just like sleep and nutrition. (Brkić, L. 2020). For younger children, we say that the most important thing is that the chosen game allows enough running, jumping, crawling, climbing, throwing, etc. Children of the middle age group are more suited to simple games with rules as well, but these rules must be respected, and this applies to all participants in the game. Children of this age have more experience, so they are more and more interested in games of catch,

hide and seek, and those alike. (Klarin, Psychology of children's play 2017). A child's developmental stages are fast and intense, and parents often do not know how to actively participate in their child's development. What many parents forget is that children learn and develop best through play, which most effectively supports the proper development of the child. Preparing a child for school should take place through play because play is the basic activity of every child of preschool age. The child can thank the game for the intensive development and acquisition of important skills and qualities such as self-control, endurance, curiosity, desire for success, as well as research passion. It is also important to know how to play with a preschooler. This is, in fact, the best guarantee of its harmonious development. The more games parents know, the better they will stimulate the child's development. (Popov 2010). Play is a spontaneous activity and the basis of children's life and development, accompanied by excitement and realized and unrealized ambitions of everyone. It is the form and means of raising a child. The game is the basis for the development and building of the entire personality of a child. (Stevanović 2003). Brewer (2008) lists the advantages and effects of using music in non-musical teaching. They believe that music can draw students' attention, create a working atmosphere, reduce learning stress, make learning enjoyable, improve student understanding, improve student memory, stimulate imagination and creativity, make exercise fun, and glorify student achievement. (Brewer 2008). The Chinese philosopher Confucius

believes that singing elevates the human heart and expresses feelings through it, but it is also a reflection of the society in which it is created. (Svalina, V., & Bognar, L. 2013). In the preschool age, according to the author Mitrović, the goal of learning is to provide the child with conditions for normal physical, intellectual, social-moral, and aesthetic development. (Klarin, Psychology of children's games 2017)

METHODS

Sample of respondents

Through this research, where 123 respondents including children and parents were included, and which was done through an online survey, we obtained certain data.

Sample of variables

We used the online survey method because of the situation in the country caused by the global pandemic of COVID-19 and due to the distance of the respondents, therefore the choice of this type of questionnaire is the safest and most effective. At the beginning of the survey, the purpose and goal of the research were explained, and data security was guaranteed to the respondents. The survey was conducted in the period from 06.22.2020 to 06.28.2020, it contains eighteen questions, of which nine questions were for parents and nine for children. The questions are based on the age and gender of children and parents, time spent in games, technology, school or kindergarten, and the impact of games on language, social and psychological development. All results are presented using graphs and tables made in Microsoft Word, 2007, with individual explanations.

Data processing methods

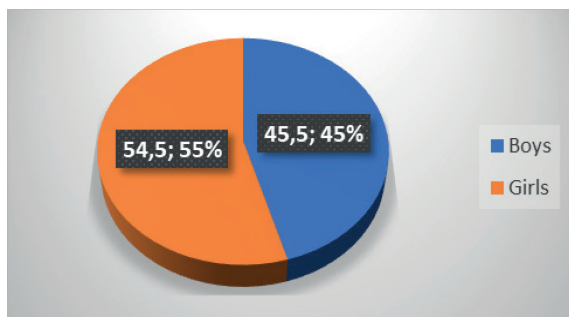
Databases were created, and processing and analysis were performed using statistical software R 4.0.3. R

is an integrated programming environment for data management, calculation, and graphical display of results. The collected data were described and analyzed using appropriate statistical methods. Method of description - describing is one of the goals of science (in addition to, for example, predicting and explaining). The comparative method, in a broader sense, is a concept of comparison that can be explained as a mental logical activity that occurs in many situations of everyday life, it consists in observing the similarities and differences between two or more things or phenomena. In a narrower sense, comparison as a scientific method is a systematic procedure that studies the relationships, similarities, and differences between two objects or phenomena to draw certain conclusions. The sampling method is a method that uses a sample to assess the characteristics of the basic set and determine the reliability and precision of that assessment. The survey method is the name for a set of procedures by which people's statements are elicited, collected, and analyzed to find out information about their behavior or about their attitudes, opinions, preferences, interests, and things alike, for statistics, public opinion polls, markets or as a basis for the needs of medical, sociological or other research, and the inductive method is a scientific method where general conclusions are reached starting from individual premises.

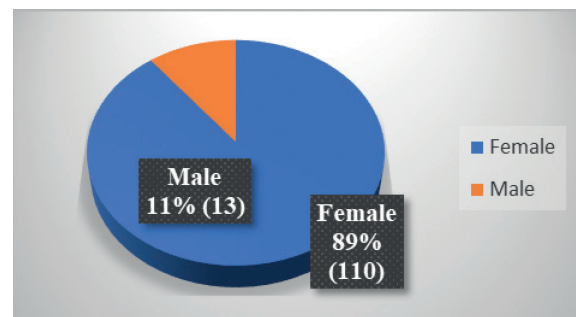
RESULTS

On graph 1, which shows the gender of children, we can notice that the number of girls (67) is higher than boys (56). Although singing games are played more prevalently in girls, due to the small number of respondents, we cannot claim that gender affects the selection of singing games, graph 2 shows that the results of the survey among parents are quite different than those among children. Singing games are more common among girls, while the number is significantly lower among boys (13). The reason probably lies in the fact that girls are more inclined to singing games than boys, who prefer "rougher" games.

Graph 1



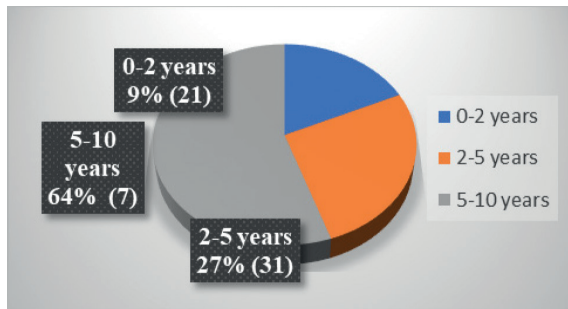
Graph 2



On graph 3 we see that the largest number of respondents are of school age (41), while the smallest number of respondents are 0-2 years old. We can conclude that games with singing are most present at school age when children are mentally and motorically

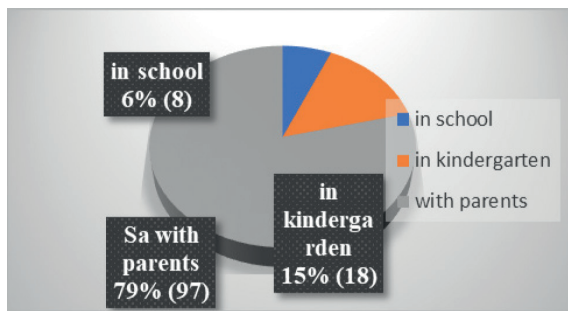
more mature and can socialize. While on graph 4 we can see that the largest number of parents are aged 25-35, which means that they were born at the end of the 20th century, we will compare the representation of games with singing in the 20th and 21st centuries.

Graph 3



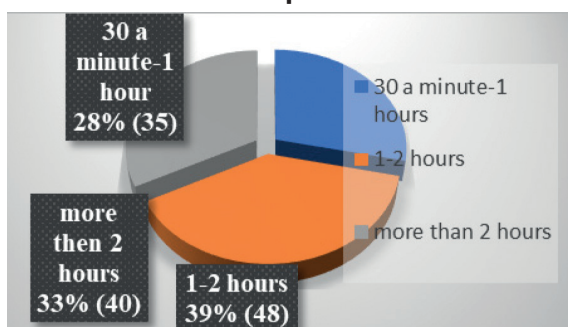
On graph 5 we can see that the largest number of children (97) spend time with their parents. In further analysis, we will determine whether games with singing are more prevalent among them or among children who spend most of their time in school or kindergarten. While in graph 6 we see the same as

Graph 5



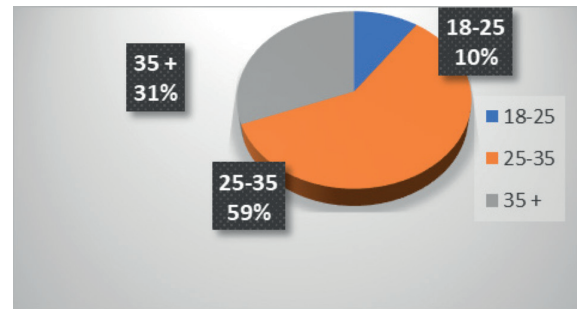
On graph 7 we see that out of 123 respondents, most of them (48) watch some of the devices for 1-2 hours, and 40 of them watch some of the devices for more than two hours a day. While on graph 8 we can see that the largest number of surveyed parents (70)

Graph 7



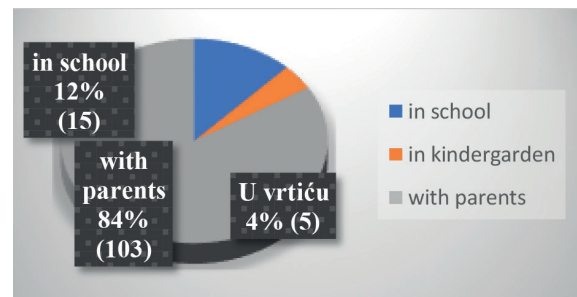
On graph 9 we can see that the representation of games with singing is present in a larger number of respondents (84), while 29 respondents do not play games with singing. Concerning their children, a greater number of respondents' parents played games

Graph 4



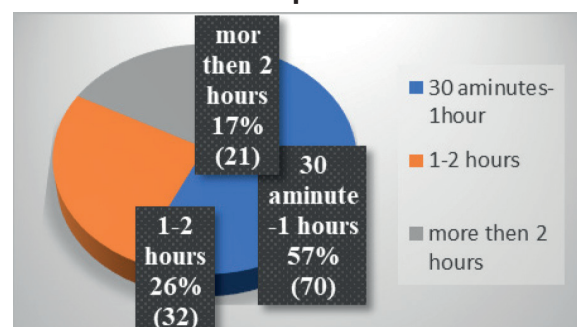
in the previous graph, we came to the understanding that the largest number of parents (103) spent their free time with their parents or another person. 5 At school 6% (8) At kindergarten 15% (18) With parents or another person.

Graph 6



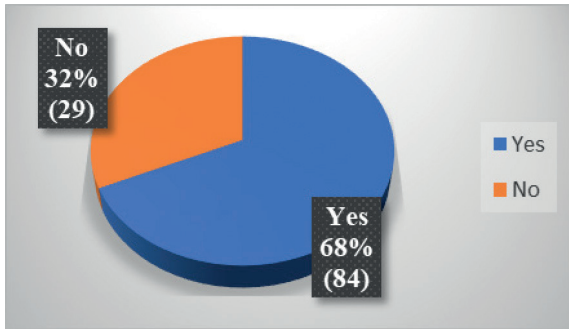
used some of the technologies daily for 30 minutes-1 per hour, which is significantly less compared to the surveyed children, 21 respondents spent more than 2 hours using technology, and 32 respondents from 1-2 hours.

Graph 8



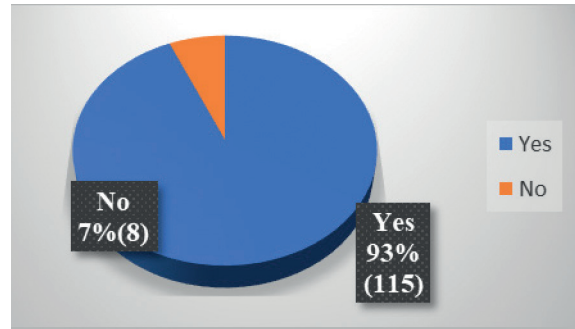
with singing in their childhood. While on graph 10 we see that out of 123 respondents, 115 respondents answered yes to the question of whether they played singing games, and 8 respondents answered the question negatively.

Graph 9



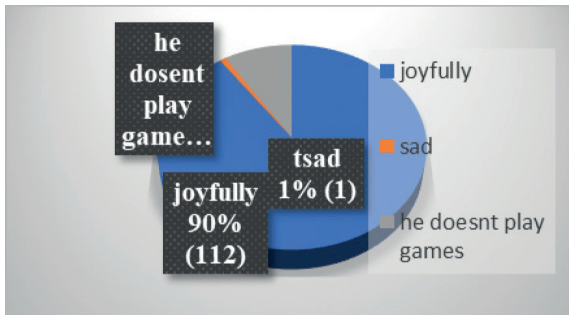
When we talk about our feelings after the game, we came to the following conclusion. Out of 123 respondents, 122 of them felt happy after the game, 1 of the respondents felt sad, and 9 of them answered that they do not play singing games. The results of

Graph 10



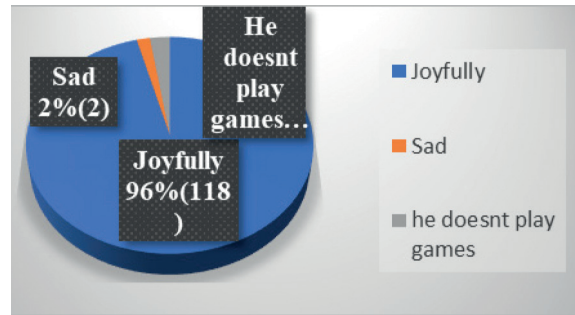
the surveyed parents on the question of how they felt after the game is like the results of the surveyed children. Out of 123 subjects, 118 felt joy after the game, 2 subjects felt sad, and 3 subjects did not play singing games.

Graph 11



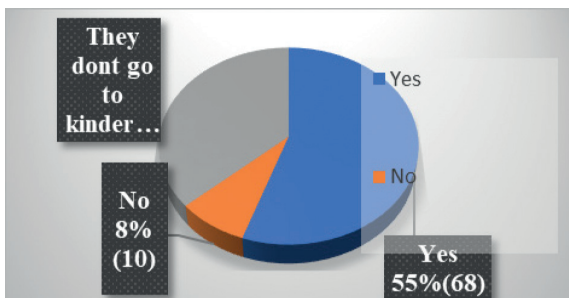
With these data in graph 13, we will determine the representation of games with singing in schools/ kindergartens. The data we received shows that 55% of children play games with singing in school/ kindergarten. We found that 37% of respondents do not attend kindergarten/school and that 8% of them do not play singing games. On graph 14, we

Graph 12



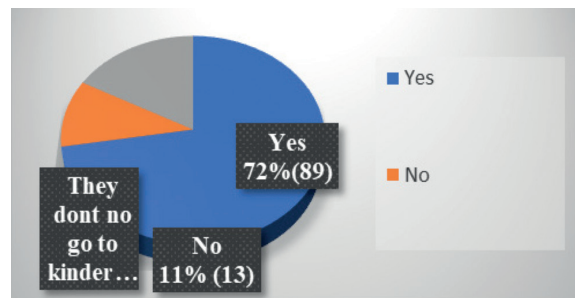
see that the results of the surveyed parents on this question are like those of the children. 72% of them answered yes to the question of whether they played games with singing in kindergarten/school, 17% did not attend kindergarten/school, and 11% did not play singing games.

Graph 13



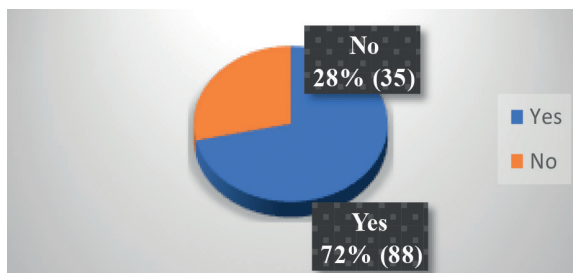
We found that out of a total of 123 children surveyed, 88 of them know 3 or more games with singing, while 35 respondents do not know games with singing (we assume that they are children aged 0-2). When

Graph 14

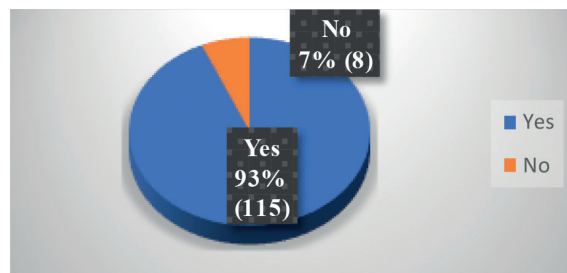


it comes to the results of the surveyed parents, we received information that most of them (115) know 3 or more games with singing, and 8 respondents are not familiar with this type of game.

Graph 15



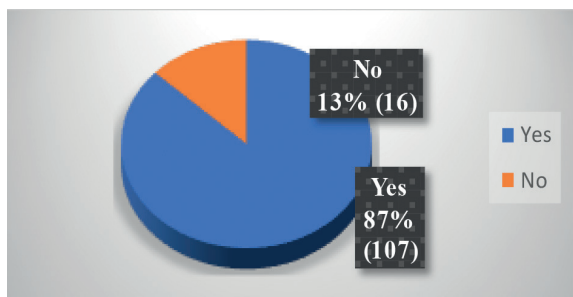
Graph 16



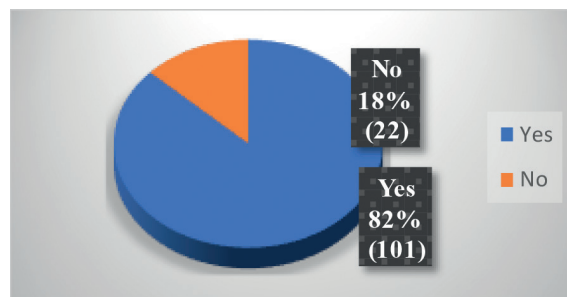
On graph 17 we can see that the results we got for this question are as follows: 87% of respondents think that games with singing influence the linguistic, psychological, and motor development of the child, and 13% of them think that games with singing do not impact on child development. While on graph 18

we can see that out of 123 surveyed parents, 101 think that singing games influenced his language, psychological, and motor development, while 22 surveyed parents think that singing games did not influence their development.

Graph 17



Graph 18



DISCUSSION

After the conducted research in which 123 respondents were included, and which was done online, we obtained certain information through the survey. The first part of the survey was related to the gender and age of children and parents, and to data on where children spend most of their time and where their parents spent it. According to parents who filled in the obtained data, the survey was mostly conducted by women, while the percentage of females among children is 54.5% and 45.5% of males. In this research, the largest percentage of children, 52%, are children aged 5-10 years old, 2-5 years old 30, 9%, and from 0-2 years 17.1%. We have also established that both children and parents spent most of their childhood time with their parents or another person. In further research, we have established that today's children use technology a lot more in comparison to their parents. We have concluded that 39% of children spend 1-2 hours using some form of technology and even 32.5% of them spend more than 2 hours with a mobile phone, computer, or television, while their parents spent a lot less of their time in their childhood with technology, 57% spent time with technology for 30 minutes to 1 hour, which is significantly less. The percentage of children who play singing games is much smaller than that of their parents. We received information that 68.3% of children play singing games, while the percentage with the parents is significantly

higher and amounts to 93.5%. When it comes to the children's feelings after the game, we concluded that both children (90.2%) and parents (94.3%) felt happy and satisfied. It is possible to say that through play, one stimulates emotions and imitates situations they experienced in prehistoric times and battle for survival. (Rašidagić 2012). When it comes to the representation of games with singing in schools or kindergartens, we determined that singing games in schools and kindergartens with assessment over 50%, although a small number of respondents attend them. It is necessary to allow the child time for the game, which as a teaching method, in each shape and for every school age, we can apply in the teaching process. (Rašidagić 2012) Music can serve as an aid in learning, memory, and concentration. We can do it in class using it as a background activity or as the main one. (Jackson 2009) We have come to data that children today know less about some from examples of games with singing about their parents. To the question "Does the child know three or more singing games?" 71.5% answered yes, while the percentage with the parents is much higher, 93.5%. We wanted to hear parents' opinions on whether games with singing can influence the linguistic, psychological, and motor development of the child and whether they influenced their development. We found that in both cases, almost 90% of parents think that games with singing can influence the child's development.

CONCLUSION

Based on the obtained data, we concluded that when it comes to games with singing, the gender and age of the child do not significantly affect them. However, it is established that games with singing are a higher percentage present in children who spend time with parents or another person, than that in children who are in kindergarten or school. Probably the cause lies in the fact that children who spend time with parents, or another person have more freedom of movement and can play in the neighborhood or park and can choose the type of game, while children in schools or kindergartens have limited time and space. According to the data we obtained, children today live in the "modern age" and during growing up, they have access to technology from an early age of childhood that they can use in the game, in contrast to their parents' upbringing. Such information leads us to the conclusion that technology reduces the desire for play, socializing and adventure can be the cause of the decreasing knowledge of singing games. The percentage of children who play games with singing is quite big and they all feel happy and satisfied after the game, which indicates the positive impact of those games. The data tells us that singing games can significantly affect the linguistic, social, and psychomotor development of the child and that they should be represented in children's educational games, both in preschool and school age. In the preschool age, according to the author Mitrović, the goal of learning is to provide the child with conditions for normal physical, intellectual, social moral, and aesthetic development. (Klarin, Psychology children's games 2017). Students accept music as part of the teaching and support the use of music in non-musical subjects. (Mijatović 2017).

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