

ISSN 1512 – 875X
ISSN 223 - 0852

SPORTSKI LOGOS



SPORTSKI LOGOS
SCIENTIFIC JOURNAL
vol.15, issue 28-29

Published by: Dzemal Bijedic University of Mostar, Faculty of Education Mostar , Department of Sport and Health

EDITORIAL OFFICE

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Printed by: „IC štamparija“ Mostar
Printed in 200 copies

Indexed in: Index Copernicus; EBSCOHost; COBISS.BA

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ACHIEVEMENT MOTIVATION AMONG ATHLETES AND NONATHLETES STUDENTS

Dijana Ivanišević, Andrea Vlašić, Ekrem Čolakhodžić

Abstract

The aim of this study was to explore the achievement motive comparing students who are athletes and non-athletes and determine potential differences in the achievement motive among students who are professional and recreational athletes. The research involved 200 students of Faculty of Education, University „Džemal Bijedić“ in Mostar: 100 students who participate in sports professionally or for recreation and 100 students who are non-athletes. The students are equally matched by the year of their studies and the average grade during their studies. The achievement motive of the respondents was evaluated by a questionnaire MOP2002 (Franceško, Mihić i Bala, 2002) and particular sociodemographic characteristics by a questionnaire constructed for the needs of this study. The results indicated statistically higher achievement motive among athletes than among non-athletes, as well as among students who are professional athletes than those who participate in sport only as a for of recreation.

Keywords: achievement motive, sports, students, athletes, non-athletes.

INTRODUCCION

Motivation is the daily trigger of every form of human behavior and action, while the achievement motivation is the specific aspiration of an individual to achieve success, whether that success is defined by realizing one's own goals and / or standing before other people.

McClelland was the first author to point to the significance of the motive for achievement, which he defined as the individual's aspiration to compete with some of the standards of extraordinary success or as a desire to overcome his or her own achievements in a central activity - economic, academic, etc. (McClelland, 1954., according to Franceško, 1995). The second component of this motive is the individual's aspiration to stand before others.

Hence, the motive for achievement is a complex motivational disposition that contains two components: the tendency of a person to set goals and tendency of a person to compete with others. By its very nature, the motive for achievement falls into social motives, which means that the degree of its development is to a large extent the result of the process of socialization. This motive is also determined as a cognitive motivational factor (McClelland, 1989, according to Franceško and Mihić, 2002) because people who have developed motive achievements are thinking and behaving in a certain way.

Summarizing McClelland's descriptions, it may be said that thinking in the terms of achievement means: dealing with the problem and clearly defining the goals, wanting the problem to be solved or achieving the goal by anticipating the feelings of satisfaction, thinking about the activities that can be undertaken to achieve the goal, predicting the difficulties that can be encountered on the way to achieving the goal or solving the problems as well as the people who can help us. The time direction of thinking is present and future, and a special empha-

sis is to learn to be here and now because it is the only starting point from which we can solve the problem. Returning to past events is motivated primarily by learning based on experience and by over-viewing one's mistakes as a form of learning and guidance for the future. Such a way of thinking is the basis for planning and organizing behavior on the way to the goal.

The motive for achievement can also be defined as the desire to achieve something difficult and to quickly organize physical objects, people and ideas (Murray, 1993). This needs to be done very quickly and independently because the numerous obstacles need to be overcome and high standards need to be achieved, which is particularly pronounced in the sporting atmosphere, whether it is an athletic or a competitive process, because in both cases the emphasis is on speed, determination, readiness, competing with each others and with ourselves and not giving up on the goals regardless of all current obstacles and unforeseen circumstances, because for athletes with high achievement motivation giving up is never an option.

Some authors consider that it is necessary to distinguish the general motive for achievement that relates to the tendency to achieve competence in each activity that is carried out from a particular achievement motivation in sports, education and professional activity (Havelka and Lazarević, 1981). However, the question remains whether there are different motivational dispositions or a motive for achievement that is reflected in a specific way depending on the observed activity. The second point seems more justified, and currently has more supporters (Mikić, 1996).

The research of achievement motivation have gone in several directions. One group of researchers was concerned with the connection of this motivational disposition with some other psychological constructs such as locus of control (Popadić, 1986, ac-

ording to Franceško and Mihić, 2002), with some of the stimulation factors for the development of the motives of achievement, such as obtaining feedback (McClelland, 1989, according to Franceško and Mihić, 2002) or with other cognitive motivational dispositions (McClelland, 1989, according to Franceško and Mihić, 2002) such as the affiliate motive and the power motive (Sokolowski, Schmalt, Langens and Puca, 2000). However, in most research the motive for achievement was observed as a factor of success in some activity (Pajares et al., 2000; Zimmerman, 2000; Puca and Schmalt, 2001).

In addition, the third group of researches can be categorized as researches dealing with the degree of development of achievement motivation in various categories of respondents: mostly students (Duda, Joan L.; Nicholls, John G., 1992), rarely executives (Franceško, 1996) and even rarer in athletes, especially in recent times (Havelek and Lazarević, 1981, according to Mikić 1996).

The rarity of these researches and the fact that these types of motivation among athletes who usually strive to provide a way to success, at the very top, are the reasons of the importance of this kind of research and therefore we are approaching the testing of achievement motivation in athletes compared to non-athletes as well as testing achievement motivation comparing professional and recreational athletes, contributing to the increase in popularization of these very interesting and significant themes at least in a small amount.

METHODS OF RESEARCH

The main problem of this research is to examine the athlete's achievement motive and to identify potential differences in comparison to a comparative sample of non-athletes. An additional problem is to examine the achievement motive in athletes who deal with sport professionally and to identify potential differences in relation to athletes who deal with sport recreationally.

Therefore, the basic objective of the research is to test the existence of statistically significant differences in achievement motivation between athletes and non-athletes as well as between professional and recreational athletes.

Led by the theoretical knowledge and the results of the previous research, this research was based on the assumption that athletes have a statistically significant higher degree of the achievement motivation than non-athletes.

Namely, since the achievement motive is in fact the need for self-improvement and the need to surpass others, it can be said that the high need for achievement is largely manifested in intense, long-lasting and repeated effort to achieve a difficult goal, in the work directed towards high or distant goals, in an effort to win, in the desire to perform better in the presence of others, in the pursuit of

competition, as well as the effort to overcome boredom or tiredness (Halvari and Thomassen, 1997; Hodge et al., 2008).

According to these findings and the fact that the basic characteristics of the achievement motive - the rapid and independent carrying out of difficult tasks, the overcoming of obstacles and becoming the best version of oneself, and the overcoming of the rival by using their talent, the basic hypothesis of this research is: "Athletes have statistically significantly higher degrees of achievement motivation than non-athletes".

After detailed overview of available literature (Duda, 1988; Duda and Nicholls, 1992; Duda and White, 1992; White and Duda, 1994; Hadfield, 1996; Lepir and Lakić, 2014), besides basic hypothesis, we set an additional hypothesis regarding the representation of achievement motives in professional and recreational athletes: "Professional athletes have a statistically significant higher degree of achievement motivation than recreational athletes."

In accordance with the set aim and hypotheses of this study, we used the following methods: questionnaire method, survey and interview, content analysis method, and empirical-nonexperimental method (survey-method). Also, the synthesis method and the induction method were used in the theoretical and empirical part as well as in the final discussion and conclusion. In addition, in the research part we used the statistical analysis and this was the basis for our discussion and conclusion.

Sample of examinees

A sample of respondents for this research consists of 200 students of the third and fourth year of the Faculty of Education at the University "Džemal Bijedić" in Mostar. Sample included students of both gender which are equated according to the year of study and average grade during the study, since it has been shown that the academic performance indicators are statistically significantly correlated with the achievement motivation.

Among 100 athletes, there are 59% males and 41% female. Among non-athletes, there are 15% males and 85% females. This means 59% males are athletes and only 15% are non-athletes; 41% female are athletes and 85% are non-athletes. 16 (27,1%) males are professional athletes while 43 of them (72,9%) are involved in sports only for the purpose of recreation; 18 females (43,9%) are professional athletes while 23 (56,1%) are only recreational athletes.

The average age of the sample $N=200$ is 23,2 years old ($SD=4,97$). The average age of students-athletes is 22,6 years old ($SD=4,52$) and students-non-athletes 23,8 years old ($SD=5,34$). This age difference is statistically insignificant ($t(198)=1,73$; $p>,05$).

Besides, athletes are practising sport recreationally or professionally between 1 and 20 years, and in

average $M = 9,1$ years ($SD = 4,78$).

Data were collected during the spring of 2017 by voluntary and anonymous filling in the questionnaire.

Sample of variables

The variables defined for this research are:

1. General achievement motivation
2. Participating and not participating in sports, whereby the subjects are classified in a group of athletes or in a group of non-athletes. In a unique group of athletes both professional and recreational athletes are included, since both have the desire, will, need and motivation to deal with sports activities (Lepir and Lakić, 2014).

Professional or recreational pursuit of sports, where professional sports mean activity, which requires a high share of free time for mastering and presenting prescribed skills, and includes encouraging and cheering, as well as selection of winners (Berryman, 1978, according to Lorger, 2011), while the recreational sport means "sport for all", which does not strive to achieve top achievements because the individual is oriented exclusively to satisfying his interests for exercise (Milanović, 2009).

Measuring instruments

The MOP2002 questionnaire (Franceško, Mihić and Bala, 2002) was used to examine the achievement motivation in this research, with the permission of the author for the application of questionnaires for research purposes and in our premises. The questionnaire consists of 55 statements and has very good metric characteristics:

Cronbach α is 0.912, and the representativity of items expressed by normalized KMO is 0.922. The aforementioned questionnaire reflects the motivation for achievement over four factors: competing with others, persistence in achieving the goals, achieving the goal as a source of satisfaction and orientation to planning. Factor analysis of the second order distinguishes a general factor with which all four primary ones are in high positive correlation (from .52 to even .84), which is quite a satisfactory result.

In addition, a *socio-demographic questionnaire* was used in this study, which was constructed for the purpose of this research. Data obtained from this non-standardized questionnaire are data on gender, age, year of study, department of study, and the success achieved during the study.

Method of data analysis

For the processing and analysis of data obtained in this research, SPSS for Windows version 21.0 was used, and expert literature was consulted for interpretation. The obtained results were analyzed qualitatively and quantitatively, and then presented in tabular form.

In addition to basic descriptive statistics, we used t-test for large independent samples and nonparametric Mann-Whitney test, looking for potentially significant statistical differences. The reliability was determined by Cronbach's alpha.

The *significance* level is set to 0,05, *meaning* that the probability of observing the *differences* seen in our data by chance is just 5%, and to 0,01, *meaning* that the probability of observing the *differences* seen in our data by chance is just 1%.

RESULTS AND DISCUSSION

After reviewing the reliability of the Scale of Performance Motivation, it was found that Cronbach's alpha coefficient is ,913 and has a very satisfactory reliability. Additionally, we examined if students athletes and students non-athletes are equal in their average grade ($U = 4963$, $p > ,05$) and by age ($t(198) = -1.73$, $p > ,05$), and only then we approached to testing the hypotheses.

Therefore, Table 1 shows the results on the Scale of Achievement Motivation - MOP, separately for students athletes and students non-athletes. According to the average values (M) of motivation for achievement, we see that the results in these two groups differ ie that athletes have achieved higher scores on the MOP scale, compared to non-athletes. However, to verify that the difference was statistically significant, we did t-test for large independent samples. The results of this analysis are shown in Table 2.

As we can see in Table 2, the students athletes and students non-athletes are statistically significantly different according to their achievement motivation, with 99% confidence level ($t(198) = 4.59$, $p < ,01$). This difference is expected and we accept the first hypothesis. Therefore, student athletes achieve statistically significantly higher scores on MOP than students non-athletes.

Since McClelland's research shows that people with a high achievement motive prefer to assume personal responsibility for their own performance and the results of those activities, to focus on their own abilities, to prefer to work in conditions where they can quickly get feedback on their performance (McClelland, 1990, according to Hodge et al., 2008), and to avoid routine performing tasks, it is entirely expected that the results of this research will be consistent with the results of earlier research in which the achievement motive for highly correlated with various aspects of personality and behavior of athletes (Halvari and Thomassen, 1997; Hodge et al., 2008).

Table 3 shows the results on the Scale of Achievement Motivation - MOP, separately for professional athletes and recreational athletes. According to the average values (M) of achievement motivation, we see that the results in these two groups differ ie that professional athletes have achieved higher scores

on the MOP scale, compared to recreational athletes. However, to verify that the difference was statistically significant, we did t-test for large independent samples. The results of this analysis are shown in Table 4.

As we can see in Table 4, the professional athletes and recreational athletes are statistically significantly different according to their achievement motivation, with 99% confidence level ($t(198) = 2,93, p < .05$). This difference is expected and we accept the second hypothesis. Therefore, professional athletes achieve statistically significantly higher scores on MOP than recreational athletes.

This may be result of the fact that people with high need for achievement involve in professional sport because of the chances to get recognized as professionals, to achieve top results, awards and many other psychological and financial rewards that are available in professional sports and not in recreational sport, where one can be mostly internally rewarded.

However, to highlight this interesting and important research topic, it would be useful to propose prospective, longitudinal studies of achievement motivation in athletes and non-athletes, because in general, research of achievement motivation in athletes today are not as frequent as they could and should be. Therefore, this fact can point to altering relevance to the achievement motivation in sport and

the success in the sport, and it should also be taken into account and explored as much as possible in the future.

CONCLUSION

In the research of athletes' and non-athletes achievement motivation in a sample of 200 participants (100 athletes and 100 non-athletes), we came to the following conclusions:

- Athletes achieve statistically higher scores on Achievement motivation than non-athletes.
- Professional athletes achieve statistically higher scores on Achievement motivation than recreational athletes.

Therefore, achievement motivation as a basic driving force for the work and success of each individual, is related to sporting activities, both professionally and recreationally in this paper. Therefore, the results of the conducted research can be useful for academic purposes, as well as trainers and sports psychologists directly involved in preparatory, training and competitive processes, as they provide interesting guidelines for further research, and then for the application of compression, in order to create achieved and satisfied athletes who succeed in living their dreams and becoming the best version of themselves and achieving outstanding results.

Table 1. Comparison of Group Descriptive Parameters Achievement motivation for students athletes and students non-athletes (N = 200)

| | DO YOU PARTICIPATE IN SPORTS? | N | M | SD | SDE |
|------------------------|-------------------------------|-----|--------|--------|-------|
| Achievement Motivation | YES | 100 | 212,97 | 22,753 | 2,275 |
| | NO | 100 | 197,84 | 23,833 | 2,383 |

Table 2. Results of testing statistical significance of differences in achievement motivation between athletes and non-athletes using t-tests for large independent samples (N = 200)

| | t | df | p | M _s -M _{ns} | SDE |
|------------------------|-------|-----|------|---------------------------------|-------|
| Achievement Motivation | 4,591 | 198 | ,000 | 15,128 | 3,295 |

Table 3. Comparison of Group Descriptive Parameters Achievement motivation for professional and recreational athletes (N = 100)

| | ARE YOU PROFESSIONAL OR RECREATIONAL ATHLETE? | N | M | SD | SDE |
|------------------------|---|----|--------|--------|-------|
| Achievement Motivation | Professional | 34 | 221,92 | 16,892 | 2,897 |
| | Recreational | 66 | 208,36 | 24,087 | 2,965 |

Table 4. Results of testing statistical significance of differences in achievement motivation between professional and recreational athletes using t-tests for large independent samples (N = 100)

| | t | df | p | M _s -M _{ns} | SDE |
|------------------------|-------|-----|------|---------------------------------|-------|
| Achievement Motivation | 2,929 | 198 | ,004 | 13,559 | 4,629 |

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VALIDATION STUDY OF THE TACTICAL-TECHNICAL AND SOCIAL COMPETENCIES OF FOOTBALL PLAYERS SCALE

Remzija Šetić, Jadranka Kolenović – Đapo, Munir Talović

Abstract

The aim of this paper is to assess the validity and reliability of the Tactical-Technical and Social Competencies of Football Players Scale (TTSCS). Overall 166 football players (N=81 seniors and 85 juniors) from several BiH Premier League clubs took part in the study. The average age of participants was M=21.14 (SD=4.91); the average age for junior players was M=17.23 (SD=0.49), while for seniors it was M=25.15 (SD=4.21). Principal component analysis revealed four factors which explain 78.78% of variance of specific competencies of football players. In accordance with item grouping, the first factor was labeled attacking tactical-technical competencies (ATTC); the second was labeled defensive-tactical competencies (DTC); third was labeled technical competencies (TC), while the fourth factor was labeled social competencies (SC). Instrument reliability was assessed on the basis of the internal reliability coefficient. Alpha coefficient values for the entire scale and for individual subscales are very high. Criterion validity of the TTSCS was assessed on the basis of its correlation with a measure of football players' self-efficacy. Correlations between self-efficacy and three competency measures range from moderate to low. In other words, there was no correlation only between self-efficacy and technical competencies scale. Results indicate that the TTSCS possesses adequate metric characteristics and can be used as a measure of specific player competencies.

Keywords: competencies, self-efficacy, metric characteristics, football players

INTRODUCTION

From a structural point of view, football belongs to the category of complex sport activities in the sports classification, as it includes adopting and developing a large number of various technical elements within the given tactical plans, as well as the ability for mutual cooperation of team members. This implies that success in football involves the interaction of several factors. As noted by Petric (1981), Jerkovic and Barisic (1993), these factors are constituted by the wide domain of knowledge and abilities: technical-tactical knowledge during the competition (competition efficiency), specific abilities, basic motoric abilities, functional abilities, morphological structure and cognitive-conative ability. Therefore, football dynamics corresponds to such a complex structural game and exposes players to the unexpected and complex situations (Samija and Bosnar, 2010). However, football players' efficiency does not only depend on their technical-tactical abilities, but also on some psychological factors (motivation, attention, attributions, self-esteem, self-efficiency, team social climate), as well as on numerous unpredictable situational factors.

Economists of sport report about the interesting findings regarding factors which yield to the sports performance. According to González-Gómez and Picazo-Tadeo (2010), studies of athletes' efficiency valuations (mostly football players) have been done in various approaches so far. Some authors analyzed specific players' efficiency (Mazur, 1994, Torgler and Schmidt, 2007), while others measured coaches' efficiency with respect to the team characteristics (Hofler and Payne, 1997; Hadley, Poitras, Ruggiero and Knowles, 2000). More specific, they measured

football players' efficiency by analyzing offensive versus defensive play style.

From the 1970's to nowadays, scientists in the field of sports psychology mostly build their theories on the cognitive models of self-confidence (e.g. Albert Bandura's socio-cognitive model, Harter's theory of competence motivation, Nicholson's theory of the perceived abilities, Vealey's model of sports self-confidence). This paradigm is today present in the Self-determination Theory. All these theories are based on the similar self-confidence model (Cox, 2005), which has been proven as a good predictor of the athletes' success (Arkes and Garskeu, 1982). Among all self-confidence concepts, the most explored in the sports studies is the concept of self-efficiency (Feltz, 1988). Feltz (1988) notes that Bandura's micro analytical approach includes several different aspects of cognitive assessment of self-efficiency: self-assessment of the abilities in specific domain of activity, under different levels of task demands in that domain and in different situational circumstances within it. Despite this broad approach, the measure of the general self-efficiency has not been proven as a good predictor of sport efficiency, since studies on it show different inconsistencies in results. For example, Martin and Gill (1991) affirmed a high correlation between self-efficiency and sports performance ($r=0.79$). In some other studies this correlation was extremely low ($r=0.1$) and in the third group of studies (McAuley, 1985, McCullagh, 1987), it was not found at all (as cited in Moritz, Feltz, Fahrback and Mack, 2000). Meta-analysis done by Moritz et al. (2000), which included 45 correlation studies, showed a moderate correlation between self-efficiency and sport performance ($r=0.38$). In another meta-analysis, done

by Feltz and Lirgga (2001), this correlation was low ($r=0.26$), while the correlation between sports performance and specific measures of self-efficiency was average ($r=0.43$).

All presented data indicate that self-confidence in its broader sense, which refers to self-efficiency and competencies as its base, is very important variable that explains the athletes' efficiency. Competencies relate to a set of knowledge, skills, abilities and attitudes that affect the estimation on self-value, which consequently affects on the success in any field of life. As noted by Helson and Stewart (1994, as cited in Larsen and Buss, 2007), competencies include a set of characteristics such as following: goal orientation, organization, efficiency, convenience, clear thinking, realism, precision, maturity and self-performance. In the model of competence motivation, Harter (1978) states that all human beings are motivated to be competent in all spheres of their lives. This disposition is not per se; it requests of the individual to invest an additional efforts in order to achieve specific skill. In this way one develops the sense of self-efficiency (an individual's assessment of his/her own ability to organize and execute certain actions needed to achieve the desired outcomes, Bandura, 1986) and the experience of personal competence. The foundation of the Harter's model points to the justification of competency testing (whereby accurate assessment of personal skills is very important), in order to develop the perceived skill to an advanced level through the adequate training.

There is a big number of instruments developed to measure self-confidence in sports. Vealey (1986) developed three instruments: (1) Scale to assess general sports self-confidence; (2) Scale to assess a state of sports self-confidence; (3) Questionnaire to assess competitive orientation. In our speaking area Samija and Bosnar (2011) created Scale for measuring self-efficiency in football players. Modeled on this scale, Samija, Sporis and Samija (2016) developed Scale for measuring self-efficiency in swimmers. Ponezic, Ivanov, Prorokovic and Cubela (1999) conducted a survey in order to check the structure of the scale created to assess self-efficiency for regular physical exercise and a scale that assesses self-efficacy for maintaining a healthy diet in the student population. However, considering the demands of modern sport, it is necessary to replicate the existing instruments and to develop new measures that will exclusively be in the function of developing and improving the existing athletes' skills and knowledge.

Since football is a specific sport and its game system is very flexible, today researchers focus on a certain conception which gives sense to the game and to the joint playing of the team, instead on focusing on the game with a strict players' disposition and roles. Disposition and roles mainly depend on the position

of the ball and its moving during the attack and defence. Tempo of the game is also faster, which can be seen in the quick switches between the phases of attack and defence. These are the reasons the top football nowadays needs players who are able to play in every position other than goalkeepers'. No matter if we speak of the phases of the attack or defence, all players of one team participate in each part of the game (Makek, 2016). A football game contains four game phases and the belonging sub phases (Basic, Barisic, Jozak and Dizdar, 2015): attack phase, defence phase, phase of transition from defence to attack (transition on the winning ball) and phase of transition from attack to defence (transition on the lost ball). The idea of constructing the scale to assess tactical-technical and social competencies is based on the football principle of notational analysis, which corresponds to the earlier noted phases. The elements of each phase of the football game are defined according to the principles of the notational analysis and with a assistance of the coaches of the clubs that play in Bosnia and Herzegovina Premier League.

The aim of this article is to assess the validity and reliability of the Tactical-technical and Social Competencies of Football Players Scale. In general, in the study is examined if this scale measures expected main phases of the football game and in which degree the scale of competence skills correlates with the estimated self-efficiency.

METHOD

Participants

Overall 166 football players from six Bosnia and Herzegovina Premier League teams participated in the study. Players included in the study compete in either BH Premier League or BH Junior Premier League. From the whole example, 81 players compete in BH Premier League in four clubs: *FC Zeljeznicar* from Sarajevo, *FC Radnik* from Bijeljina, *FC Mladost* from Dobojski Kakanj and *FC Krupa* from Krupa on Vrbas. The number of Junior Premier League players in the study was 85 and they play for the following four clubs: *FC Zeljeznicar* from Sarajevo, *FC Sarajevo* from Sarajevo, *FC Mladost* from Kakanj and *FC Sloboda* from Tuzla. The study involved football players of all positions in the team, other than goalkeepers. The average age of the participants is $M=21.14$ years ($SD=4.91$). The average age of the seniors is $M=25.15$ ($SD=4.21$) and juniors is $M=17.23$ ($SD=0.49$).

Measuring instruments

General Information Questionnaire

General Information Questionnaire was designed for this study. It included questions referring to the players' age, selection (juniors/seniors), club they play for, length of playing in the current club, playing position and the length of training football (the length of overall football experience).

Tactical-technical and Social Competencies of Football Players Scale (TTSCS)

Tactical-technical and Social Competencies of Football Players Scale (Setic, Kolenovic-Djapo and Talovic, 2016) was also developed for this study. It contains 42 items characteristic for four phases of a football game: attack, transition on the lost ball, transition on the winning ball and defense. Participants were asked to mark the level of their success on each of these items on the scale from 1 to 7 (1-bad performance, 7-excellent performance). The result is calculated as a linear combination of answers given on each item. Speaking of the subscales, it is notable that none of them has the same number of items. Subscale that refers to the elements of game in the phase of attack has 17 items, one that refers to the transition on the lost ball has 6 items, one that refers to the winning ball has 5 items and the subscale of the defense phase has 14 items. The cause of this uneven number of items is in the core structure of the football game, where the phases of attack and defense are more demanding and last longer compared to the other two phases. The transition phases last two or three seconds and therefore require fewer elements of the football game. The items typical for the subscale "attack phase" are: "I am successful in double passes" and "I receive and carry the ball under the pressure of the opponent players". An example of an item in the subscale "transition on the winning ball" is "I carry the ball until the attack condition is secured". In the subscale "defense", some of the items are: "I cover the opponent players"; "I recognize the moment of seizing the ball and react properly"; "I make an immediate pressure to the opponent player close to a ball". The last subscale, "transition on the lost ball" includes, among the others, the following item: "I come in time and set up a basic defense formation". An item that appears in all the subscales is "I timely communicate with my team players during the game (I am good at verbal and nonverbal communication)". Internal reliability coefficient for the whole instrument is high ($\alpha = 0.986$). Calculated reliability coefficients for the TTSCS subscales are also high as follows: subscale "attack phase": $\alpha = 0.962$; "transition on the winning ball": $\alpha = 0.925$; "transition on the lost ball": $\alpha = 0.966$; "defense phase": $\alpha = 0.943$.

Self-efficiency in Football Players Assessment Scale

Self-efficiency in Football Players Assessment Scale (Samija and Bosnar, 2010) includes 21 items pertaining to the assessment of the performance of certain actions during football games evaluated by the participants on the five-tier scale of the Likert type, where a higher result indicates a higher self-efficiency level. In spite of the satisfying metric characteristics, the scale does not differentiate players with lower perceived self-efficiency well enough. Authors Samija and Bosnar (2010) explain

this phenomenon through the partly homogenous sample they used for the validation (which mostly included juniors and cadets). An example of an item in this scale is: "I do not give up on dribbling either when I'm nervous and badly moody". Authors report about a high internal reliability coefficient of the scale ($\alpha = 0.841$). This coefficient is also high in our study ($\alpha = 0.894$).

Procedure

The survey was conducted individually. The participants were given general and specific instructions about the way of answering questions given in the scales. Each participant coded his questionnaires and filled them in after the instruments were introduced. The questionnaires were completed in a paper-pencil method and the filling time was not limited. It lasted 15 minutes in average.

RESULTS

Construct validity of the instrument for the assessment of the tactical-technical and social competencies in football players is verified by factor analysis. In order to check the suitability of the correlation matrix for carrying out the factor analysis, the Kaiser-Meyer-Olkin test and the Bartlett spherical test were conducted. The value of the Kaiser-Meyer-Olkin test of the sample adequacy is 0.964, which indicates our data were suitable for the factor analysis conduction. The Bartlett's spherically test, determined by calculating an approximate hi-square, is 8799.273 and it is statistically significant at 99.9%, which indicates that data are suitable to factorization, and rejects the assumption about the equality of correlation matrices and identity matrices.

An explanatory factor analysis was performed using the method of the principal components. On the set of manifest variables using the Kaiser-Guttman criterion, four components with characteristic roots greater than 1 have been determined. Factor structure with Varimax rotation explains 78.78% of the total variance. Table 1 shows the factors' saturation, the distribution of individual subscales by the components obtained, the values of the characteristic roots, and the percentages of the explanation of the variance of each component after applying the Varimax rotation. The resulting factor structure is interpretable and consistent with the expected.

The first factor includes items from the attack domain and the transition on the winning ball. It is therefore called *attacking tactical-technical competence (ATTC)*. It encompasses skills and abilities needed in the attack phase, which includes skills such as playing long passes, achieving goals, ability to carry the ball until the "space" for the attack is opened. This factor explains 26% of the variance.

The second factor explains 21% of the variance and includes items from the domain of defense and the transition on the lost ball, and is called *defensive*

tactical competence (DTC). This factor includes abilities such as: strictly covering an opponent's player, reducing the opponent's space for action, maintaining a defensive pressure (making pressure on an opponent's ball carrier or player near the ball).

The third factor includes items from the defense domain and one item from the domain of the attack. Due to the content of the particles that describe the situation of direct contact with the opponent in the defense phase, it is named *technical competence in the duel (TCD)*. This factor explains 19% of the total variance and includes items related to success in an aerial duel, blocking the opponents' shots, breaking the ball in the duel.

The fourth factor includes items that relate to communication in all phases of the football game, as well as items that describe co-operation with matchmakers. Therefore, this factor is called *social competence (SC)* and it explains 12% of the variance. When it comes to factors loading of the items, the following results were obtained: 16 items have the primary factor saturation by the first factor, 13 items have the primary factor saturation by the second factor, eight items have the primary saturation with the third factor, and five particles are primarily saturated with the fourth factor (Table 1). Loadings for the first factor range from 0.56 to 0.82, for the second factor from 0.52 to 0.70, for the third factor from 0.64 to 0.81 and for the last one from 0.65 to 0.74.

Some particles are also saturated by other factors, especially those related to defensive tactical competences (for example, the item "I play quick pass to use badly organized opponent's defense"). In fact, the claims of the second and third factors relate mostly to the defense phase and the transition phase on the lost ball.

Criterion validity of the scale for measuring the competence skills is verified on the basis of an external criterion which refers to the assessment of the self-efficiency specific to football. The correlation between these two variables was calculated by Pearson's correlation coefficient. The moderate correlation between the measure of the self-efficiency and the subscale attacking tactical-technical competency ($r=0.249$, $p>0.01$) was determined. A low but statistically significant correlation ($r=0.198$, $p>0.05$) was obtained between self-efficacy and social competences. Between the self-efficacy and technical competence correlation was not found.

DISCUSSION AND CONCLUSIONS

The aim of this paper was an assessment of the validity and reliability of the Tactical-Technical and Social Competencies of Football Players Scale (TTSCS). In order to assess factor structure of the scale, factor analysis was conducted on the items of the scale. It was done by the principal components

analysis on the overall sample junior and senior football players. Obtained data indicate an existence of four factors, which explain 78.78% variance of the competence skills of the football players. Since the items grouped in four interpretable factors, they were named as follows: *attacking tactical-technical competencies (ATTC)*; *defensive-tactical competencies (DTC)*; *technical competencies (TC)*, *social competencies (SC)*. As presented in Table 1, the greatest percentage of the overall variance is explained by the ATTC and DTC, which is in accordance with two main styles of the football game: attacking and defensive game style. The third factor is called technical competencies (TC) and it refers to the universal skills and abilities for the main phases of the game, attack and defense. This is due to the modern football characteristics, since it became a flexible game where every player, other than goalkeeper, can and should switch positions depending on the set tactics (which can also be changed during the game, depending of the result). This means every player, despite of the primarily defined position, has to have abilities and have technical knowledge which are needed in all ninety minutes of a game. Fourth factor, social competencies (SC) explains less percentage of the variance (Table 1); yet it is significant, which is reasonable since football belongs to the group of team sports.

Reliability of the instrument is assessed by the calculating the internal reliability coefficient, which was high ($\alpha=0.986$). Its subscales have reliability as follows: attacking technical-tactical competencies: $\alpha=0.970$; defensive tactical competencies: $\alpha=0.982$; tactical competencies in duel: $\alpha=0.943$; social competencies: $\alpha=0.970$.

The results of the correlational analysis indicate that the greatest correlation is between the subscale ATTC and the measure of self-efficiency. This suggests that players who are more efficient in the game perceive their selves more efficient. Also, the higher an assessment of the defensive competencies is, the higher is a result on the self-efficiency scale. Having in mind the limitations of the correlation studies, these results can be also interpreted vice versa. Here is important to stress that the self-assessment scales in football players include their attitudes both towards their success in defense and in attack. Future research should question the multidimensionality of this self-efficiency scale, which is indicated by the content of its items.

In the end, as suggested by Harter (1978), competencies in the first place need to be examined because of their motivational strength, which influences development of the self-efficiency or self-confidence, in the broader sense. In the case of our study, it is about the sports self-confidence, which Vealey (1986, p.222) defined as „an individual's belief in his or her capabilities to be successful in sports“. Very important role in the develop-

ment of self-confidence (which we proved is saturated by competencies and self-efficiency) is played by the coaches. This leads to the conclusion that the realistic players' self-assessment of their competencies can be a useful information to the coaches, in the way of giving them an insight in the value of the adequate approach and connection between „good technical-tactical-physical preparation and self-confidence" (Balent, Sasek and Kobilsek, 2017, p.79).

In spite of the satisfactory psychometric characteristics of the scale for assessing competencies among football players, future researches should involve a greater number of social-competence-related items, since football is a team sport which depends a lot on the intergroup interaction. It is also necessary to include particles related to cognitive factors: perception and attention. Though the subscale defensive-tactical competencies contains some items which include perception (for example, „I come in time and set up a basic defense formation“).

In order to have a more objective picture of the knowledge, skills and abilities of football players, it

is important for coaches to evaluate competencies of the players and to check the degree of agreement between self-assessment and real assessment. Just like any other scale of self-efficiency, the scale for competitive skills assess should be adjusted for other sports (and include tactical-technical elements specific for them).

Considering the satisfactory metric characteristics of the Tactical-technical and Social Competencies in Football Players Scale, it can and should be used in future studies. However, these future studies need to replicate the presented one, to modify the scale with the above-mentioned recommendations and to expand the obtained findings on other samples.

Although we observe the football game globally, it is difficult to make the final conclusions without taking into account the situational factors (which is sometimes impossible with regard to the dynamics of football games). In fact, according to Birman (2011, p.240), soccer is a complex sport, and "seizure of the ball may be the result of a bad position in the game, but it can also be a feature of a fantastic defensive defeat."

Table 1: Factor structure of the Tactical-technical and Social Competencies of Football Players Scale's items after Varimax rotation

| Items | Components | | | |
|--|--|--------------------------------|-----------------------------------|--------------------|
| | attacking tactical-technical competences | defensive tactical competences | technical competences in the duel | social competences |
| I play back pass (I assist in scoring). | .826 | | | |
| I am good at dribbling. | .809 | | | |
| I score. | .801 | | | |
| I receive and carry the ball under the pressure of the opponent players. | .759 | | | |
| When it comes to shooting, I can evaluate the situation well enough. | .758 | | | |
| Leading the ball | .746 | | | |
| I play without hesitation. | .699 | | | |
| I play quick pass to use badly organized opponent's defense | .683 | .405 | | |
| I carry the ball until the attack condition is secured. | .667 | | | |
| I shoot center shots and long passes. | .666 | | | |
| I make long passes. | .662 | | .423 | |
| I am efficient in fainting. | .662 | .433 | | |
| I play on time (I quickly circulate the ball). | .622 | | | .411 |
| I make long passes. | .619 | | | |
| I show to the carriers. | .587 | .586 | | |
| I create a space for showing myself and the other players. | .562 | .522 | | .416 |
| I make pressure to the opponent players near the ball. | | .707 | .464 | |
| I can reduce opponents' attack space. | | .702 | .423 | |
| I make pressure to the opponent carriers. | | .671 | .494 | |
| I move towards the ball when it is in the opponents' possession. | .418 | .662 | .431 | |

| | | | | |
|---|--------|--------|--------|--------|
| I come in time and set up a basic defense formation. | | .661 | | |
| I recognize the moment of seizing the ball and react properly. | | .657 | .403 | |
| I recognize and play the ball pressing. | .400 | .653 | .415 | |
| I make an immediate pressure to the player with a ball. | .416 | .652 | .426 | |
| I make an immediate pressure to the opponent player close to a ball. | .471 | .651 | | |
| I cover the opponent players. | | .618 | .482 | |
| I come behind the ball in time. | | .604 | | .448 |
| I show in front of the ball. | | .593 | .433 | |
| I cover my team's pitch. | .473 | .522 | | |
| I am successful at the aerial duel. | | | .813 | |
| I save balls with sliding tackle. | | | .761 | |
| I win balls in duels. | | | .735 | |
| I am successful in flick header. | | | .735 | |
| I take away balls with sliding tackle. | | | .733 | .408 |
| I obstruct the opponents' shooting. | | | .703 | |
| I win ball in duels. | | .426 | .695 | |
| I am successful at man-to-man duel. | | .481 | .647 | |
| I timely communicate with my team players during the game (I am good at verbal and non-verbal communication). | | | | .740 |
| I timely communicate with my team players during the game (I am good at verbal and non-verbal communication). | | | | .697 |
| I timely communicate with my team players during the game (I am good at verbal and non-verbal communication). | | .409 | | .695 |
| I timely communicate with my team players during the game (I am good at verbal and non-verbal communication). | .401 | | | .686 |
| I cooperate with my team mates from other positions. | .498 | .436 | | .569 |
| Eigen value | 10.884 | 8.861 | 8.032 | 5.312 |
| % of the explained variance | 25.914 | 21.097 | 19.123 | 12.649 |

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EFFECTS OF THE IMPLEMENTATION OF METHODOLOGICAL ORGANIZATIONAL WORKING METHODS ON THE SITUATIONAL MOTORIC CAPABILITIES OF PUPILS

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Abstract

The aim of this research is to define possible differences between various treated groups of subjects due to the methodical organizational work used in teaching physical and health education. We are talking about the method of parallel analyses of sample results from experimental group and control group in order to define effects of change within situational motoric capabilities in handball of pupils (198 boys and girls), fifth grade of elementary schools (age 10-11), divided in two sub samples. Experimental group (N=99) and control group (N=99). Experimental group had lessons of physical and health education that is organized by complex group methodical organizational work (parallel classroom work, parallel classroom work with additional exercises, parallel alternative work, parallel alternative work with additional exercises, alternative classroom work, alternative classroom work and alternative classroom work with additional exercises). Control group teaching methods had no complex group methodical organization work but it was more simple methodical organizational work (frontal, working with three subjects, working with four subjects). This particular research has confirmed the hypothesis on influence of complex methodical organizational work in order to increase effects of work in physical and health education. With reference to, it pointed out the significant advantage of complex methodical organizational work that contributed to the experimental group and its intensification of teaching process and it that matter provided achievement of better results in the field of situational motoric capabilities than the control group.

Keywords: intensification of physical education teaching methods, situational motoric tests in handball, complex and simple methodical organizational work methods

INTRODUCTION

When we speak about physical and health education there are different methodical organizational work methods. Some authors are dividing this methods on classical and contemporary, or complex and simple methodical organizational work methods. This classification is inadequate in case those methodical organization work methods are not implemented in a accurate way and the teacher does not obtain all necessary preparations. On the other hand, there are examples from the practice that some of the teachers, using classical or more simple methodical organizational methods of work have achieved great educational and training results. Each methodical organizational work method whether it is "classical" ("simple") or „contemporary" („complex"), is viewed as well chosen and correct in case that selection of the organizational work method is well and appropriately chosen, if the selection of that organizational method of work is based upon an adequate chosen tasks according to the age pupils, their pre knowledge, etc. In physical and health education teaching process when we speak about basic methodical organizational methods of work, we speak about frontal method of work, group work and individual work. In the teaching practice of physical and health education there are attempts that the frontal work generates differential ballast of the pupils' organism, which means that different pupils get different tasks. But, it is not any longer about frontal, it is more about individual work. The fact is that frontal method of work is mostly work on the identical program content, but

in the definition it is accentuated that there could be a various forms of tasks, but the number of various working tasks in this teaching unit is very limited and hardly feasible. Group working method is a such methodical organizational working method in which pupils of one class (classroom), according to specified criteria, divided in groups, in order to achieve better success practicing on physical and health education classes. But the decision from the teacher to select a methodical organizational working method is influenced by numerous factors that are not standardized and inconstant. Number of pupils within the group or classroom depends, before all, on the age of pupils, but also on the programme content that are part of the physical and health education. Some of the goals, tasks and effects are better achieved by frontal, some of them by group, and the most of them by individual method of work. There are also certain number of neutral methodical organizational work methods. Some of them are creating conditions for transition to the other methods (from simpler methods towards more complex). Transitional forms of methodical organizational working methods are used to create new methodical organizational methods of work. They can be used on different ways: individually, in the combination or simultaneously implementation of various work methods. Implementation of methodical organizational work methods in the practice starts at the first grade of elementary school, from the frontal method aiming towards group working methods. That transition is conditioned by age of pupils and several other factors. It means that sim-

ple methods are followed towards complex group work methods. More complex methodical organizational work methods should dominate in the higher grades. Well-chosen and adequately implemented method of work is the method that contributes higher intensification, optimization and individualisation of work, and according to this, humanization of the physical exercise process (Hadžikadunić i Mađarević, 2004). In order to achieve this, it is necessary to alternate previous technology of teaching within the physical and health education. New technology of teaching should be based upon the relevant information on the process and efficiency of the technology and achieved results. Without these information none of the participants in the teaching process of physical and health education will not be satisfied, because there will be no ways to establish which factors produced good or bad result and will be not able to perform necessary correction of the programme and working methods. When speaking about human activity control, the main role is within objective methods that are presented in the different domains such are measuring somatic, motoric, cognitive and conative characteristic of personality. Present method of testing the knowledge and capabilities of pupils in the school psychical and health education as well as within the training process shows certain deficiencies. Due to the inadequate teaching and training practice, that is relied on momentary impressions and opinions about the pupil and sportiest, there are very often justified objections that validations are correct. There is a great need to bring into the work more elements of objective measuring in order for subjective factor to be disconnected and reduce it on the minimal scale. It would not be correct to disregard subjective capability of the teacher or trainer, in order to follow and validate the success of pupil/sportiest. Nonetheless, it is more valuable that those subjective conclusions by the teacher/trainer could be confirmed by the objective measures. That is why we have a approach called scientific introduction for pupils and athletes capabilities and characteristics, defining their individual characteristics and capabilities at the development level of their psychomotor characteristics, especially those one that are obtained in the sports games, training processes of the physical and health education. There are a lot of benefits from this type of method for the teachers and trainers. This is the way teachers and trainers can control themselves, pupils and athletes, measure their results of prepared teaching and training work and if necessary for their corrections. Pupils and athletes are able to follow their own progress what constantly influence their further work and aiming better results. This type of method have become constant practice of some teachers in the process of physical and health education as well as of some trainers too. But, tempo for the introduction of this kind of method in

more schools and sport clubs is still very slow. Many authors have researched improvement of work efficiency within physical and health education by implementing different modalities of differentiated teaching of physical education, and some of them are: Hadžikadunić and associates (2004), Tonči and associates (2006), Hadžikadunić and Mijanović (2010), Hadžikadunić and associates (2011), Hadžikadunić and associates (2013), Hadžikadunić, Novaković and Džibrić (2016).

WORKING METHODS

Starting from the current researches that are related to this particular scientific problem of impacts and efficiency of different teaching models, curriculums, and intensification of classes on situational motoric capabilities of pupils, there is a hypothesis of this research: There are acceptable statistical significant quantitative effects within the structure of situational motoric capabilities in the handball, pupils of the experimental group regarding the pupils from the control group.

Sample of the research

The sample is 198 boys and girls out of population of fifth grade students from the elementary schools (age 10-11), divided into two sub samples. Experimental group (N=99) have participated at the classes of physical and health education, organized by complex group methodical organizational working methods (parallel classroom method of work, parallel classroom method of work with additional exercises, group constant method of work, parallel non-constant work with additional exercises, non-constant classroom method of work, non-constant classroom method of work with additional exercises). In the teaching process of control group (N=99), complex group methodical organizational work methods were not used, but implemented were simple methodical organizational methods (frontal, work with three pupils, work with four pupils). Both groups attended the same programme out of 70 hours per year, two times per week, the same topics were listened, with the same number of equipment and teaching tools.

Variables sample

For the assessment situational organizational motoric capabilities we have used variables according to the suggestion of Association of Experts in the field of physical and health education of Canton Sarajevo (Hadžikadunić and associates 2001). For the assessments of adopted knowledge from handball, we have used following tests: 1. Throwing and catching the ball and on the wall that lasted 30 seconds (UBC), 2. Leading the ball in slalom (UVO), 3. Penalty shot (SED). Measures in the space of situational motoric capabilities of pupils are conducted at the teaching classes of psychical and health educa-

tion within fifth grades in the school classroom. All measures were done by the same group of people. Tests were deliverable in a way that tiredness of pupils from previous tests would not influence pupils. Measures were organized by the system of cells where pupils walk circularly from one working spot towards another.

Methods of data analyses

In order to establish whether there are changes in researching places under the influence of one year programme within the psychical and health education, we have worked in two modules, and later we tried to specify the core of certain changes, contribution of the factors of the complex treatment (one year of psychical education programme) that subsidised to these changes by establishing partial quantitative differences of the implemented situational organizational motoric variables of the same assessment but through efficiency of handball in two sub samples (experimental and control group), by T – test. In order to establish global quantitative differences of the results of the situational motoric capabilities between students of experimental and control groups, we have used analyses of discrimination. Criteria for this type of analyses of these variables were so called Wilks Lambda interpretation. For the interpretation we have used significant discriminative variables and they explain certain percentage of variability.

RESULTS AND DISCUSSION

Establishing partial quantitative differences of the implanted situational motoric variables in the assessment of situational motoric efficiency of handball among two sub samples (experimental and control group) was done by T – test. Analyses of arithmetical middle values (Mean), and based upon the significance of differences (Sig) among pupils divided in two sub samples, experimental and control group, we can observe certain differences in the arithmetical middle values of implemented variables of situational motoric capabilities from the handball. These differences are beneficial for the experimental group, where values of arithmetical middle that asses the technique of throwing and catching the ball of the wall in 30 seconds (UBC), and technique of leading the ball in slalom (UVO) showed some better values, and variable that estimates techniques of penalty shots (SED), are beneficial to the control group. (Table 1.).

By analysing values from Table 2., we can see that only one variable that estimates technique of throwing and catching the ball (UBC) gained coefficient of significance. (Sig = or < .05).

Estimation of global quantitative differences of the results for the implemented situational motoric variables in handball between two sub samples (experimental and control group), is done by dis-

crimination analyses. By the analyses in Table 3., we notice only one significant discriminative coefficient and it is 42. This value shows us the correlation of all implemented data based upon we have performed this type of analyses.

By the analyses of the results from Table. We can notice that the biggest contribution t the discriminatory function has the variable for the assessment of technique of ball leading (UVO).

Based upon results in the Table 5. We can see that the biggest correlations with discriminatory function, with variable that maximally differentiate values of results of situational motoric capabilities of two sub samples is the variable for the assessment of technique of throwing and catching the ball (UBC), followed by variables for the techniques of shot (SED) and techniques of leading the ball (UVO). Taking into the consideration previous statements from the analyses of T – test, and discriminatory analyses, and based upon gained parameters we can conclude that differences in the values of results for the situational motoric capabilities between pupils of experimental and control group, that are beneficial for the experimental group (UBC) and (UVO), while variable for the estimation penalty shot capabilities (SED), is beneficial for the control group. Very similar results are provided by Hadžikadunić, Novaković and Džibrić (2016) in the place of assessment of situational motoric capabilities of pupils in the experimental and control groups in basketball, where we have established that the biggest differences are in variables that assess the speed of throwing and catching the ball (KBC), and variables that assess the speed of leading the ball (KVO), as well as the estimation of situational motoric tests in handball in this particular research. Differences in achieved results in the estimation of situational efficiency in certain tests in handball, are viewed among experimental and control groups. At the same time respecting information gained in current researches in the place of intensification of psychical and health education teaching process, we can conclude that implementation of complex methodical organizational working methods with additional exercises, which due to the higher percentage of used main «A», part of the hour is reflected toward the use of general hour that contributes higher intensification, rationalization, humanization and individualization of the management process of exercises.

CONCLUSION REMARKS

This research has confirmed the hypothesis on influence of the complex methodical organizational working methods on increasing the effects of work that is related to the physical and health education. It pointed out that there is significance advantage of more complex methodical organizational working methods in the experimental group have contribut-

ed to the intensification of teaching process and create conditions for achievements of better results in the place of situational motoric capabilities in handball regarding the control group. Out of presented results of this research, it is noticeable that more complex methodical organizational working methods are more implemented in the realization of

programme contents of psychical and health education of pupils from the fifth grade during one school year, and significantly influence partial and quantitative changes in the frame of located space in contrast of the pupils from the control group that implement more modest methodical organizational working methods.

Table 1. Differences between experimental and control groups in the place of situational motoric in handball

| Variables | Groups | Mean | Std. Deviation | N |
|-----------|--------|---------|----------------|----|
| UBC (R1) | 1 | 24,6465 | 5,80871 | 99 |
| | 2 | 19,6364 | 7,91338 | 99 |
| UVO (R2) | 1 | 5,9596 | 2,84612 | 99 |
| | 2 | 6,1616 | 2,46488 | 99 |
| SED R(3) | 1 | 10,4080 | 2,15520 | 99 |
| | 2 | 11,0768 | 2,92379 | 99 |

Table 2. Differences between experimental and control group in the place of situational motoric in handball

Tests of Equality of Group Means

| | Wilks' Lambda | F | df1 | df2 | Sig. |
|----|---------------|--------|-----|-----|------|
| R1 | ,884 | 25,788 | 1 | 196 | ,000 |
| R2 | ,999 | ,285 | 1 | 196 | ,594 |
| R3 | ,983 | 3,356 | 1 | 196 | ,068 |

Table 3. Significance of isolated discriminative functions

| Function | Eigenvalue | % Of Variance | Cumulative % | Canonical Correlation | Test of Function(s) | Wilks Lambda | Chi-square | df | Sig |
|----------|------------|---------------|--------------|-----------------------|---------------------|--------------|------------|----|------|
| 1. | ,215a | 100,0 | 100,0 | ,421 | 1 | ,823 | 37,864 | 3 | ,000 |

Table 4. Standardized discriminative coefficients

| Variables | Function 1 |
|-----------|------------|
| UBC (R1) | 1,105 |
| UVO (R2) | -,782 |
| SED (R3) | -,253 |

Table 5. Structure of discriminatory function and centroids of groups

| Variables | Function 1 |
|-----------|------------|
| UBC (R1) | ,782 |
| SED (R3) | -,282 |
| UVO (R2) | -,082 |
| Group 1 | ,461 |
| Group 2 | -,461 |

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INFLUENCE OF ANTHROPOMETRY ON SWIMMING SPEED

Boris Kajan

Abstract

The purpose of this paper is researching influence of anthropometric characteristics on swimming speed. The main question is: can swimmers with longer hands and legs have better results in specific swimming techniques? Therefore, I decided to carry out the research working with children in Academic swimming club Zrinjski. The swimming club Zrinjski gave the requirement for the research and it is approved by swimmers' parents. All the measurements were done on Faculty of Science and Education in Mostar. The examinees sample consists of young male and female swimmers, aged 11 to 14 years ($n=24$, 14 boys and 10 girls), all of them being members of Academic swimming club Zrinjski. During the testing, we were using anthropometric measurements according to IBP. The measurement is prescribed by International biological programme IBP which prescribes 39 measurements and enables result comparison. IBP predicts that measuring symmetrical parts of the body is to be processed on the left side of the body (Mišigoj-Duraković, 2008). The measuring is done based on anthropometric spots. There are also different limitations to be taken into consideration when generalizing and explaining the results. Testing was carried out in only one swimming club with 24 swimmers, also, it must be mentioned that the tested swimmers are at sensitive age of puberty, which means that they are growing and developing and this can also influence on swimming speed and results. I found out that anthropometry has not significantly influenced swimming speed in four swimming techniques.

Keywords: swimming, anthropometry

INTRODUCTION

The topic and the purpose of this paper is researching influence of anthropometric characteristics on swimming speed. In another words, the main question is: can swimmers with longer hands and legs have better results in specific swimming techniques? Based on research of this or similar theme it can be concluded that the results depend on swimming abilities, and not only on anthropometric characteristics.

Speed swimming and energy consumption depend on laws of water medium, so they determine propulsion, body position in water, energy consumption and space structure of motoric abilities of swimmers with dominant strength, speed, flexibility and coordination (Volčanšek, B., 1995). Therefore, I decided to carry out the research working with children in Academic swimming club Zrinjski. I thought that testing them would prove me some presupposed results. I found out that anthropometry has not significantly influenced swimming speed in four swimming techniques. There are also different limitations to be taken into consideration when generalizing and explaining the results. Testing was carried out in only one swimming club with 24 swimmers – 14 of them are boys and 10 of them are girls. The results cannot be understood as widely representative among population of young swimmers. Also, it must be mentioned that the tested swimmers are at sensitive age of puberty, which means that they are growing and developing and this can also influence on swimming speed and results. The tested children are not involved in swimming equally in terms of time, so the research is also limited by that fact.

PURPOSE OF THE RESEARCH

The purpose of this research is to establish the connection between anthropometric abilities and swimming speed, also to evaluate how and to what extent anthropometry influences swimming speed in all four swimming techniques.

Research hypothesis

The following hypothesis can be set in the research:
H1: Anthropometric variables have significant influence on swimming speed in all four swimming techniques.

RESEARCH METHODS

Examinees

The examinees sample consists of young male and female swimmers, aged 11 to 14 years ($n=24$, 14 boys and 10 girls), all of them being members of Academic swimming club Zrinjski.

Variable samples

During the testing, we were using anthropometric measurements according to IBP, i. e. body height, length of left and right arm, length of left and right leg, length of left and right fist, length of left and right foot, shoulders width, left and right fist width, left and right foot width, thighs volume, lower leg volume, left and right upper arm volume, left and right forearm volume, stomach volume and crinkles.

Measure instruments

Morphological anthropometry is the method which includes measuring of human body and processing and researching of obtained measurements. It is applied in many areas, such as kinesiology sports and recreation. In morphological anthropometry we

use methrical system, i. e. basic measuring units of methrical system.

Short explanation of anthropometric characteristics measuring method:

The measurement is prescribed by International biological programme IBP which prescribes 39 measurements and enables result comparison. IBP predicts that measuring symmetrical parts of the body is to be processed on the left side of the body. The measuring is done based on anthropometric spots. These spots are determined by inspection, palpation and marked with demographic pen and it should be all done before the measuring itself. Anthropometric spots are divided into fixed anthropometric spots and virtual ones.

Anthropometric instruments:

- 1.scale 2. anthropometer 3. pelvimeter 4. kefalometer 5. sliding caliper 6. caliper 7. centimeter tape

Along the anthropometric measurements, swimming speed was measured on the distance of 25 metres for all four swimming techniques.

Stopwatch was used for measuring the speed and the task was to swim out the given distance in as shorter amount of time as possible. The speed is

measured operatively on the distance of 25 metres. The maximum speed is accomplished couple of metres after diving out of water after the start sign, then that speed lasts for 10 - 15 seconds, afterwards it decreases.

Data processing methods

The research data were processed according to STATISTICA Version 7, Statsoft, Inc. (2005) System.

The following statistic procedures have been used: Descriptive statistics – for determining descriptive parametres of anthropometric tests and test of swimming speed on 25 metres distance in backstroke, breaststroke, butterfly and freestyle techniques

Regressive analysis – for determining influence of anthropometric characteristics on swimming speed.

RESULTS

Descriptive statistics

Descriptive statistics was used to determine arithmetic mean, standard deviation, minimum and maximum results, skewness (distribution asymmetry) and kurtosis (extention measure) in all anthropometric and speed tests of swimming in all four techniques. The results are given in

Table 1. Results of swimming speed

| Variable | Descriptive statistics | | | | | |
|----------|------------------------|-------|-------|-------|-------|-------|
| | AS | MIN | MAKS | SD | ASD | MJI |
| 25mK | 18,82 | 14,00 | 22,16 | 2,393 | -0,50 | -0,86 |
| 25mP | 24,41 | 18,00 | 30,08 | 3,314 | -0,14 | -0,56 |
| 25mL | 22,74 | 17,57 | 28,10 | 3,038 | -0,19 | -0,83 |
| 25mD | 23,87 | 16,39 | 33,04 | 4,506 | 0,13 | -0,87 |

Table 1. shows results of swimming speed in all four swimming techniques. It is obvious that arithmetic mean in freestyle technique is 18.82, breaststroke 24.41, backstroke 22.74, butterfly 23.87, so it can be

concluded that freestyle is the fastest technique, and breaststroke is the slowest one. Minimum and maximum result is also given for all four swimming techniques.

Table 2. The results in all variables used are normally distributed

| Variable | KS test | | |
|----------|---------|--------|---------|
| | N | maks D | K-S p |
| 25mK | 24 | 0,13 | p > .20 |
| 25mP | 24 | 0,12 | p > .20 |
| 25mL | 24 | 0,11 | p > .20 |
| 25mD | 24 | 0,13 | p > .20 |

This given table shows that the reulsts in all variables used are normally distributed, i. e. none of the distributions deviates signficiantly from the normal, Gauss distribution (p = 0, 20).

Regressive analysis

Is used to determine influence of anthropometric abilites on swimming speed in all four techniques.

Table 3 and 4. Results of regressive analysis freestyle

| Statistics | Regressive analysis: 25m K | |
|-------------------------|----------------------------|--|
| | Value | |
| R | 0,90 | |
| R ² | 0,81 | |
| Adjusted R ² | 0,11 | |
| F | 1,15 | |
| p | 0,48 | |

| Statistics | Regressive analysis: 25mK | |
|-------------------------|---------------------------|--|
| | Value | |
| R | 0,85 | |
| R ² | 0,72 | |
| Adjusted R ² | 0,47 | |
| F | 2,83 | |
| p | 0,04 | |

As it can be seen from the given tables, set of predictors variables multiple correlation coefficient (anthropometry) with criteria variable (freestyle swimming speed) is $R=0.89$ in the first table and $R=0.85$ in second table. The mistake in the first table is $p = 0.47$, and in second one $p = 0.04$. Concerning the mistakes we cannot definitely conclude that the connection is significant and that the given predictor variables significantly explain variance of criteria variable, i. e. freestyle swimming speed. The results of partial regressive coefficients show that none of the predictor variables used has statistically significant connection with criteria variable on level $p < 0.05$. It can be concluded that none of the mentioned anthropometries has influence on freestyle swimming speed. The Table shows that determined coefficient of multiple correlation between anthropometry and breaststroke swimming technique is 0.75 in the first table, 0.72 in second table, and the testing mistake is $p = 0.95$ (first table) and $p = 0.38$ (second table). It can be concluded that anthropometry does not influence on swimming speed in breaststroke technique. The explained part of criteria variable variance is $R=0.57$ in the first Table, and $R=0.52$ in the second Table. The other, unexplained part of variance is 43 in the first Table and 48 in the second one, which means that there are other capabilities influence on swimming speed, which were not the subject of this research.

Analyzing influence of anthropometry on backstroke swimming technique, multiple correlation coefficient is determined, and it is $R=0.79$ in the first table and $R=0.76$ in the second one. The explained part of criteria variable variance is $R^2=0.62$ in the first Table, and $R^2=0.57$ in the second one, which means that the unexplained part which can influence on the results is 38 and 43. Testing mistake is $p=0.90$ in the first table and $p=0.26$ in the second one, but it cannot be certainly concluded that this connection is significant and that anthropometry influences backstroke swimming speed. The tables shown prove that multiple correlation coefficient is $R=0.86$ in the first table and $R=0.88$ in the second one. Mistake in the first table cannot be seen as statistically significant, as the mistake of statistic conclusion is over 0.05 (it is $p=0.69$, to be more

precise), while in the second table it can be stated as significant because $p = 0.02$, which means it is under permissible value of 0.05.

The only significant anthropometric variable which influences on the swimming speed in butterfly technique is NABL (crinkle), with mistake of 0.04 Beta (standardized partial regressive coefficient) is 0.90, while B (non-standardized regressive coefficient) is 1.0.

DISCUSSION

The aim of the research was to determine influence of anthropometric abilities (body height and weight, arm extent, hands, legs, fist, feet length, shoulder, fist, feet width, crinkles, upper-arm, forearm, stomach, thighs volume and crinkles) on swimming speed in all four techniques, backstroke, breaststroke, freestyle, butterfly stroke. The research has been carried out among 24 swimmers of Academic swimming club Zrinjski in Mostar, age-ranged 11 to 14, fourteen of them boys and 10 girls. The swimmers underwent anthropometric measurements and speed measurement on 25 metres distance in breaststroke, freestyle, butterfly and backstroke technique. The results were descriptively statistically processed and the results of arithmetic mean, minimum and maximum results, kurtosis (extension measure), skewness (distribution assymetry) and standard deviation were viewed.

Regressive analysis was used to determine comparison of anthropometry influence on swimming speed in all four techniques. Four regressive analysis were calculated, with equal set of predictor variables (results of anthropometry measurements), and with different criteria variable, i. e. swimming speed in all four swimming techniques.

The given results show that anthropometric characteristics in the beginning of one's swimming career have no significant influence. In the early age swimming technique should be perfected, and later, when all the techniques can be well performed and automatized, certain influence can be proven. When it comes to high level swimming quality, even the smallest details can influence swimming speed and the swimmer's achieved time. On that level,

anthropometric characteristics have strong influence on one's swimming speed on a certain distance.

CONCLUSION

Research on influence of anthropometric abilities on swimming speed has been carried out among 24 swimmers of Academic Swimming club Zrinjki, Mostar. Some measurements have been done (body height and weight, arm extent, arms, legs, fist, feet length, feet, shoulder, fist width, upper arm volume, forearm volume, thighs and stomach volume, and

crinkles), as well as swimming speed on 25 metres distance in freestyle, backstroke, breaststroke and butterfly technique. It has been proven that suggested anthropometric variables do not influence significantly on swimming speed in all four swimming techniques.

The testing included relatively small number of examinees, all of them being age-ranged 11 to 14, when children enter the period of intense growth and development, which can influence results and swimming techniques of examinees.

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ANALYSIS OF ANTHROPOLOGICAL CHARACTERISTICS IMPORTANT FOR PERFORMANCE OF ASSIGNMENTS BY VIP CLOSE PROTECTION TEAMS

Moratić Zlatko, Admir Hadžikadunić, Jasmin Ahić

Abstract

Members of security services only begin to get trained for the assignments ahead of them after they have completed their basic training and entered the parent unit. This refers to the members of services for protection of persons and facilities of special importance. Joining the said services represents the beginning of specialist training and adoption of new tactics and techniques, which are used in this demanding business, thus profiling and filtering the people for the performance of special assignments in the VIP Close Protection team. The goal of this Paper is to present necessary anthropological characteristics important for the performance of general and specific assignments of the members of the VIP Close Protection teams before and after joining the service. For the purpose of this paper, an expert analysis was carried out which involved 24 experts in the field of close protection from the region and Europe. These experts have been the members of VIP protection services for minimum 5 years, and have occupied all positions in the close protection team. In this expert analysis, there have also been evaluated the necessary anthropological characteristics of the VIP close protection teams working at the mid-level threat in compliance with the model most frequently used in the region and Europe, which involves the use of minimum two vehicles during the VIP security transportation in motor vehicles and mid-level number of agents. The results of this research indicate that it is more important to evaluate the characteristics of the close protection team members after their recruitment than prior to it. Conative characteristics and cognitive skills have proven to be the most important in the recruitment process. After the expert analysis of anthropological characteristics that were evaluated after the recruitment was conducted, they were found to be more important after the recruitment than before it.

Keywords: expert analysis, close protection, human potentials, VIP (very important person)

INTRODUCTION

With the rise in security threats and the manner of execution of terrorist attacks both in the region and throughout the world, the need for protection of persons and facilities of special importance imposes itself as one of the basic tasks of security services. The abbreviation used in professional literature is *VIP (very important person. Very Important Person* (hereinafter the VIP) is the abbreviation, which refers to a very important person, a head of state or government, i.e. other senior political official, senior military commander, i.e. another person of special importance to whom special treatment is provided for a special reason. Sometime, abbreviation **VVIP, Very, Very Important Person** is used in order to emphasize the importance of that person in relation to other VIPs. This abbreviation is most commonly used when marking seats or holding a larger number of VIPs in one place, in order to determine the persons' level of importance at the given time, in accordance with the global protocol standards, and is in principle rarely used. (Moratić i Ahić, 2015:21). There are special models that determine the size of protection team, number of agents, number of vehicles, logistical support, and overall planning of a protection operation, which is further classified by the level of threat for the VIP as follows: high level of threat which entails a larger number of agents and minimum three vehicles in formation (*high threat*), mid-level of threat, which entails a mid-level number of agents and minimum two vehicles (this is

the most frequently used threat level applied in Europe and BiH - *mid threat*); this threat level has been the subject of the mentioned expert analysis; and low level of threat, which entails a minimum number of agents and at least one vehicle (*low threat*).

The selection of human resources for the needs of security services whose primary task is the protection of persons and facilities of special importance is a serious and complex process, of which the major goal is to find an adequate way to provide a sufficient number of candidates among whom it is possible to select the ones best meeting the terms of reference and assignments, needed for the performance of everyday assignments of certain security services.

If there is awareness that people, with their interests, skills and knowledge represent the priority resource in police organization, it is clear why the human resource management in security services is one of the most important prerequisites for security services' efficiency and effectiveness. (Obradović, 2011). It is important to note that there exists no 100% protection (Rađenović, 2003). In the security structures whose basic task is the protection of VIPs, an unwritten rule applies that one who tries to protect everything and everybody will protect nothing and nobody. A carefully selected and trained close protection team can do only two things when it comes to the protection of VIPs and facilities of special importance, and they are as follows: to act pre-emptively and discourage

potential attackers with their appearance in public on daily basis (Korajlić i Dautbegović, 2012); due to the proper selection and training of the close protection team, to react in timely fashion and thus prompt the attackers to miss their target in the first attack (Moratić i Ahić, 2015).

It is known that mistakes in the selection of proper candidates in the services for protection of persons and facilities threaten the security of persons and facilities under protection. On the other hand, the said mistakes may have various adverse consequences for the very security service member, such as an increased possibility of injuries at work with potential long-term disability (Anderson, Plecas & Segger, 2001). The elements which are currently used in practice for police purposes and the initial classification of police officers are the degree of motor and functional abilities, individual's health (determined by the results of the previously conducted general medical examination), and degree of education. Functional-motor abilities provide for elementary safety in the selection of candidates for particular jobs, primarily in terms of the description of assignment they perform (Hadžikadunić, Šuvalija i Bajraktarević, 2013:109). According to Cochrane et al. (2003), there are several factors influencing the potential success or failure of candidates, which fact makes the agencies very concerned about the emotional or psychological adequacy of the candidates when recruiting them for the jobs of protection of persons and facilities. Taking into account the fact that throughout human history, the act of assassination was one of the main tools used to destroy states and their systems, it is logical that protection mechanisms to prevent it were also developed in this context.

It is close to impossible, or extremely hard, to predict any activity of any human being if there is no sufficient information about his/her important characteristics and abilities, such as biological-physiological and psychological characteristics, which is largely related to anthropological understanding of human peculiarities and the attempt to look at every human activity as a result of activation of a very complex, highly-organized bio-psychosocial system (Šošić i Rađo, 1998). This kind of metatheoretical approach can still offer certain solutions related to the selection of human resources and potentials for the purposes of performance of VIP protection-related jobs, since certain fields of anthropology do not have equally well developed procedures and methods for the evaluation of basic

latent dimensions¹ necessary for the performance of particular human activities, or such procedures are so demanding in terms of the time or economic cost of such measurements, that it is very hard to find sufficient data that provide an accurate enough insight in the realistic structure of latent dimensions required to perform a complex VIP protection job. The methods used in the selection of human resources and potentials required for the performance of a VIP protection job, were recognized in the distant past, however those selection procedures were based on practical experience. The first selection procedures based on scientific facts were conducted in the modern age, and they primarily refer to motor abilities², functional abilities³, anthropological⁴ and conative characteristics⁵, and specific skills and knowledge. The elements currently used in the selection of human resources for the needs of police, military and guards, and for initial classification are the degree of motor and functional abilities, individual's health (determined on the basis of the previously conducted general medical examination)

¹ In the field of kinesiology, we frequently notice phenomena, which are not directly measurable and require the application of the precisely defined methods, which help us get the data about truly important anthropological characteristics of individuals or groups of people.

² The term: motor abilities, mostly translated as physical abilities, appeared in the works of the physical education theoreticians at the end of XIX century and early XX century. In addition to "physical abilities", other terms were also used, such as "motion characteristics", "physical qualities", "motion qualities" etc. Since recently, the most frequently used term has been "motor abilities", which is, at least in experimental research, usually reduced to operationally defined latent dimensions derived from a system of measuring tools. (Šošić i Rađo, 1998).

³ The adaptation of organism as a whole to systematic physical loads is achieved with the increase of functional abilities of all individual organic systems, particularly the function of cardio-respiratory system. (Šošić i Rađo, 1998).

⁴ The dimensions and proportions of the body as a whole or its individual segments. Standard anthropometric dimensions include body height and mass, length of arms and legs, arm range, skin-fold thickness, volume and bone range of body segments. Certain human activities have a defined anthropometric profile (e.g. preferred body height) (Ostojčić, 2006).

⁵ For the personality characteristics which are included in the field of conative dimensions (in the broadest sense) of the anthropological space, it is very hard to find an accurate theoretical explanation, although they are simultaneously particularly important for the understanding and prediction of human behavior. It has become almost trivial to state that the realization of human's intellectual potential cannot be successful if a person as a whole is not emotionally stable, socially adapted and integrated. (Šošić i Rađo, 1998).

and degree of education. Functional-motor abilities provide for elementary safety in the selection of candidates for particular jobs, primarily in terms of the description of assignments they perform. The analysis of psychological and sociological characteristics, and intrinsic and extrinsic motivation to work in special-purpose services has been almost absolutely neglected. Through the activities in which they are engaged, people reach their goals under the influence of personal (intrinsic) and external (extrinsic) motivational factors, or they do not achieve them due to amotivation, which is of extreme importance for the police system. Assessment of psychological characteristics in the selection of human resources and potentials for special purposes is an assessment of work ability through a formal, specialized examination of a candidate, an officer, which results in objective evidence proving that a candidate is, or is not, able to perform a defined job safely and efficiently, and that his/her ability/disability may be caused by his/her psychological condition or impairment. The basic purpose of psychological assessment of candidates is to determine whether a candidate is able to safely and efficiently perform the most important duties within his or her job.

RESEARCH METHODOLOGY

The sample of examinees for the purpose of this research comprised 24 experts from the close protection field from the region and Europe, who volunteered to participate in this research. They all have minimum five years of experience of working in the field of VIP close protection, and they have all occupied all positions in the close protection team. The expert analysis was conducted on the basis of a questionnaire in which the questions were predefined, with a 5-degree scale, which served for the assessment of importance of anthropological characteristics of human potentials, defined as the factors of general characteristics (appearance, previous experience in close protection jobs, education, special skills and knowledge, communication); the examinees had the opportunity to assess, on the scale from 1 to 5, the importance of general characteristics needed when recruiting candidates. The

general characteristics of human potentials after the recruitment (OONPS), where the examinees had the opportunity to assess, on the scale from 1 to 5, the importance of general characteristics needed after the recruitment of candidates are as follows: team work, work under stress, power of perception, ability to develop special skills and knowledge, planning, organization and control. The collective scores of OOPPS and OONPS were also calculated after the receipt of data, and their comparison was conducted for the purpose of meeting the fundamental goal of the paper.

Methods of Data Processing

For all variables, central and dispersion parameters ($AS \pm SD$) were calculated, and distribution normality assessed using the Kolmogorov-Smirnov (KS) test. The sum of individual scores of general characteristics was calculated to determine the OOPPS and OONPS. The statistical significance of the differences between OOPPS and OONPS was established by the Wilcoxon test, while the statistical differences between the individual scores of general characteristics within OOPPS and OONPS were calculated by the Friedman test. The level of statistical significance was set at $p < 0.05$. All analyses were performed using SPSS program package for the Windows operating system.

Results

In accordance with the set goals, the results of this study indicate the following:

1. There exists a difference between the measurable factors of OOPPS and OONPS. After the evaluation of general characteristics, the difference in favor of OONPS was noticed.
2. The evaluated general characteristic, which has been found to be the most important one in the course of measuring of OOPPS is **communication**; in the OONPS measuring, it is **teamwork**.
3. The evaluated general characteristic which has been found to be the most important one in the entire expert analysis is **teamwork**.
4. The OOPPS measurements have proven there is a statistically significant difference, while it is not the case with OONPS.

Table 1. Descriptive Statistics

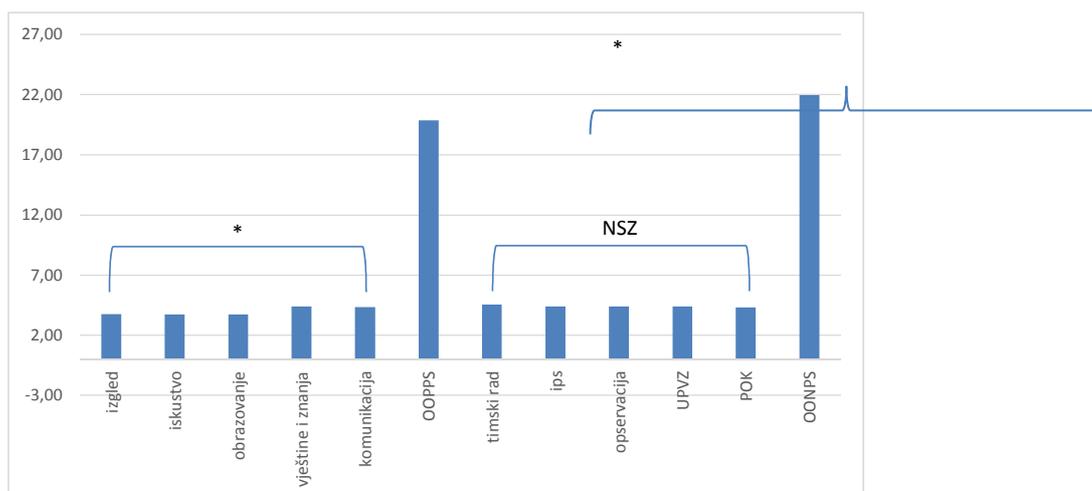
| Descriptive Statistics | | |
|------------------------|-------|----------------|
| | Mean | Std. Deviation |
| Appearance | 3,75 | 1,07 |
| Experience | 3,71 | 0,99 |
| Education | 3,71 | 1,43 |
| Skills and knowledge | 4,37 | 0,82 |
| Communication | 4,33 | 1,05 |
| OOPPS | 19,87 | 3,73 |
| Team work | 4,54 | 0,88 |
| Ips | 4,37 | 1,21 |
| Observation | 4,37 | 1,24 |

| | | |
|-------|-------|------|
| UPVZ | 4,37 | 1,01 |
| POK | 4,29 | 0,95 |
| OONPS | 21,96 | 4,14 |

Table 2. Level of Statistical Significance within and between Factors

| Level of statistical significance within and between factors | | |
|--|----------------|-----------------|
| Description | Within factors | Between factors |
| OOPPS | 0,001* | <0,001** |
| OONPS | 0,256* | |
| *Friedman's test **Wilcoxon's test | | |

Graph 1. Graphical Presentation of Individual Characteristics and Corresponding Statistical Significance



DISCUSSION

The selection of candidates for the jobs in the field of close protection of persons and facilities of special importance plays a very important role for both the parent unit and society as a whole in terms of security (Anderson et al. 2001). For this reason, only the candidates who demonstrate a satisfactory knowledge level, and meet the general requirements for admission to educational programs, are sent to further police officer training. After the admission, the training of police officers may be classified using various criteria; most frequently, it is classified according to the skills they develop: physical training, handling of official firearms, tactical training, specialist training, general knowledge (Nikać i Simić, 2013). Bearing in mind that at the basic training courses for police officers, the training for protection of persons and facilities of special importance is conducted exclusively through specialist courses (basic-level training) it is of crucial importance that the training and obtaining of knowledge continue after they join their parent unit. The results of the Wilcoxon test indicate that there is a statistically significant difference between

the general characteristics of human potentials when recruited, OOPPS, and the general characteristics of human potentials after the recruitment, OONPS. The general characteristics which have been evaluated: appearance, previous experience in the jobs of close protection and education with regard to OOPPS, have been found less important in relation to evaluated parameters: team player, work under stress, power of perception, development of special skills and knowledge, planning, organization and control with regard to OONPS. The general characteristics like skills, knowledge and communication, have been found to be almost equal with regard to OOPPS in relation to all OONPS parameters. The evaluated general characteristic – **communication** - has been found to be the most important with regard to OOPPS, while **the teamwork** as the general characteristic has been found to be the most important with regard to OONPS. **Teamwork** has also been found to be the most important general characteristic in this expert analysis. When all the above is taken into account, together with technical development and logistical support of the agency

they work for, the difference is clear between bodyguards and trained members of the VIP close protection team (Moratić i Ahić, 2015). Bodyguards react by nature and the criterion for their recruitment is mostly their appearance, not their knowledge, training and ability to react properly, while the close protection team members are professionals, defined by their communication skill, multiple-month training, flexibility, ability to plan thoroughly and fully implement the protection mission. The results of expert analysis provide enough material for more serious and detailed planning of the development of general characteristics necessary during and after recruitment, when it comes to the recruitment and selection of human resources in the services whose basic task is the protection of persons and facilities of special importance.

CONCLUSION

Human resource management has become one of the crucial issues for security agencies worldwide, mostly due to significant changes in the way terrorist attacks are executed, and more sophisticated threats, as well as due to the nature

and manner of execution of everyday assignments. When it comes to public security, public expectations are always, in principle, at a high level, and when something happens, managers in security agencies are exposed to great pressure. Any failure of the Human Resource Department may have significant consequences for both human resources, and the organizational unit structure. Any reaction or use of a member of the aforementioned services, aimed at rejecting a threat or attack on a person or facilities of special importance, which is in compliance with legal authorities, in principle represents a serious violation of basic human rights. For this reason, the assessment of recruitment and selection of human resources in the security services, concretely in the agencies to protect persons and facilities, is of particular importance, therefore it should be very carefully planned and implemented. Based on all the aforementioned, we can conclude that the results of this research possess a capacity to improve and create new training models, and criteria for forming the teams, which work at the mid-level security threats bearing in mind the characteristics of the said team members.

(Meaning of abbreviations OOPPS and OONPS used in this paper:

OOPPS – general characteristics of human potentials when recruited

OONPS – general characteristics of human potentials after recruitment)

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- Zakon o Direkciji za koordinaciju policijskih tijela BiH od 15.02.2012
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- Zakon o policiji Ministarstva unutrašnjih poslova Republike Hrvatske, NN34/11, NN130/12, NN33/15
- Zakon o policijskim poslovima i ovlastima Ministarstva unutrašnjih poslova Republike Hrvatske NN76/09, NN92/14
- Uredba o određivanju štice osoba, objekata i prostora te provođenju njihove zaštite i osiguranja NN46/13

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THE IMPACT OF BASIC-MOTOR SKILLS IN SPEEDY LONG JUMP AND 60 METERS LOW START

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Abstract

The development of any form of movement and even the simplest one cannot be accomplished without the proper level of motor skills. From this point of view, also the motor skills cannot be displayed without the presence of movement, according to the space-time characteristics as well as its respective intent.

The sample in this paper was selected by the regular students of the high school "Marin Barleti" from Gjilan, for the realization of this research were included 75 students, aged 16, who through 7 basic motor variables and 2 criterion variables give us a realistic picture by confirming the purpose and the problem of this research. Based on the purpose and importance of this paper, which is the determination of the magnitude of the impact of basic motor variables (such as a prediction system) in this case in two criterion variables pertaining to the three discipline competition of school (60 meters running and speedy long jump) in this case was applied regression analysis.

From the results achieved in the motor-basic space in two criterion variables have shown valid results: MKGJVR (sig.000), and MVR60M (sig.000), as well as for the completion of this paper we can emphasize that with the results obtained during the conduct of this paper has been achieved its main goal, the results achieved give us a realistic insight into the students' knowledge of the subject of physical education and sport, and in particular in athletics, which justifies the data and results of previous studies that analyzed similar issues and problems.

Keywords: motor abilities, prediction, criterion skills, regression analysis and physical education.

INTRODUCTION

Looking at the structure in some athletic disciplines, many authors have found that success in Athletics depends on several factors, among them the most important are motor skills, cognitive and anthropometric skills which are manifested in all sports, and in particular in the educational process.

The development of any form of movement and even the simplest one cannot be accomplished without the proper level of motor skills. From this point of view, motor skills cannot be displayed without the presence of movement, according to the space-time characteristics as well as its respective intent. These skills provide robust, fast, durable, accurate, and coordinated power in the implementation of various motor tasks (Pavlović, 2006). The structure of the athletics multidiscipline is quite complex and it is a very complicated structure by the nature of the execution and the achievement of important results. Athletics multidiscipline starts from three school disciplines up to ten Olympics discipline that must include all the disciplines like as: running, jumping and throws, and here we have elaborated the impact of motor skills in a speedy long jump with and a 60m run. Such a study was carried out in order to determine the impact of basic and specific motor variables on the results of 60m sprint (Schneider, 1994).

Success in athletics depends from the length of the step and its density in the time units. In this case we are dealing with a speedy long jump which consists of 4 momentum stages, final striving, flight and landing.

This paper deals with 75 male students aged 16, who are regular students and have 2 hours of

Physical Education according to curriculum at the "Marin Barleti" high school in Gjilan. For maintaining of physical skills, more precisely has determined S.Izrael (1978), where sports medicine, physical ability considers as a quantitative and qualitative opportunity for carrying out movement activities.

METHODS

Tested samples

In this research were included 75 students (male) of the high school "Marin Barleti" in Gjilan who were enrolled in the school year 2015 - 2016, where the students for the first time were subjected to such testing, they did not have proper knowledge for such research. The health of the tested students has been good.

The group of basic-motor variables hypothetically covers the purpose and the problem of the research. In this research are included 7 basic motor variables, which are as follows:

Long jump from the place - (MKGJV), High Jump from the place - (MKLARV), Throwing a medical ball - (MHMEDC), running 20 m high start - (MVR20M), triple jump from the place - (MTRHVE), jumping with the right foot from the place - (MKDC), jumping with the left foot from the place - (MKKMV)

The group of criterion variables in this paper is presented through two variables:

- Long Jump - (MKGJVR),
- 60m Low Start - (MVR60M)

RESULTS AND DISCUSSIONS

Basic Statistical Parameters of Male Students

In this research are applied seven motor variable and two variables criteria, a set of variables that are

thought to be important parameters for this paper. In table no.1 are presented the results of the basic statistical parameters of male students. In this table are presented the basic static results: number of individuals (n) minimum score (min), maximum (max.), arithmetic average (mean), standard deviation (std. dev), asymmetric measures (skew and kurt). Based on the results obtained in the table no. 1 between the minimum and maximum results reflected by standard deviation, some of the values are presented as high as in the MTRH variable with min. values 520.45, max. 715.25. the arithmetic

average, 630.36 and the highest standard deviation 42.31, then the MHMEDC variable with min. 390.38, max. 702.98. arithmetic average, 569.07 and high value standard deviation standard 69.01, MKGJVR variable with min. 260.45, max. 450.26. arithmetic mean, 366.04 and high value standard deviation standard 38.79. Given that we are dealing with a non-selected group of students we can conclude that the high values of standard deviation in these variables are reflected as a result of a heterogeneous group.

Table 1. Basic statistical parameters of basic motor measurement in predictor system and criterion system of students

| Variables | N | Min. | Max. | Mean | Std. Dev. | Skew. | Kurt. |
|-----------|----|--------|--------|----------|----------------|-------|-------|
| MKVGJ | 75 | 155.05 | 235.20 | 200.4418 | 18.3412 | -.339 | -.599 |
| MTRHV | 75 | 520.45 | 715.25 | 630.3688 | 42.3178 | -.265 | -.397 |
| MKKVD | 75 | 130.50 | 210.35 | 171.8045 | 16.2720 | -.386 | .573 |
| MKKVM | 75 | 130.32 | 211.30 | 174.7768 | 15.1229 | -.365 | .913 |
| MHMEDC | 75 | 390.38 | 702.98 | 569.0727 | 69.0153 | .052 | -.390 |
| MKLARV | 75 | 35.00 | 63.02 | 45.8567 | 5.5450 | .533 | .740 |
| MVR20M | 75 | 3.12 | 4.28 | 3.6924 | .2703 | -.552 | -.090 |
| MKGJVR | 75 | 260.45 | 450.26 | 366.0437 | 38.7917 | -.327 | .164 |
| MVR60M | 75 | 7.94 | 11.00 | 9.3072 | .6413 | .255 | -.066 |

Based on the purpose of this paper, regression analysis has been applied to show what impacts have criterion variables among students in the educational process involved in the paper. We can also anticipate in what extent criterion variables can be influenced to the results in relation to the predictor system of the basic motor variables.

Consequently were presented two first tables with the main elements of the regression analysis of male student measurements as follows: Multiple correlations (R) which shows the value of the correlation between all predictive variables and that criterion. Coefficient of determination (Adjusted R square),

which shows the percentage of common variance between predictor variables and that criterion. Validation (Sig F change), which shows the statistical validity at the level of reliability .01.

Also, for the fulfilment and detailed understanding of the relationships and the determination of the partial influence of the predictor variables are presented also the values of the partial coefficient BETA and the partial correlation **Part**, which represents the partial correlation between the predictor variables and the criterion variables upon elimination of the impact of all other variables.

Table 2. Regression analysis of the variable (MKGJVR)

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
|-------|------|----------|-------------------|----------------------------|-----------------|----------|-----|-----|---------------|
| 1 | .651 | .423 | .363 | 30.9626 | .423 | 7.022 | 7 | 67 | .000 |

a Predictors: (Constant), MVR20M, MHMEDC, MKVD, MKLARV, MTRHV, MKVGJ, MKVM
ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|-------|-------------|
| Regression | 47123.129 | 7 | 6731.876 | 7.022 | .000 |
| Residual | 64231.715 | 67 | 958.682 | | |
| Total | 111354.844 | 74 | | | |

a Predictors: (Constant), MVR20M, MHMEDC, MKVD, MKLARV, MTRHV, MKVGJ, MKVM

b Dependent Variable: MKGJVR
Coefficients

| variables | B | Std. Error | Beta | t | Sig. |
|------------|---------|------------|-------|--------|-------------|
| (Constant) | 109.094 | 111.591 | | .978 | .332 |
| MKVGJ | -.003 | .286 | -.018 | -.136 | .892 |
| MTRHV | .570 | .116 | .622 | 4.898 | .000 |
| MKVD | -.005 | .304 | -.025 | -.192 | .848 |
| MKVM | .257 | .354 | .100 | .727 | .470 |
| MHMEDC | -.004 | .062 | -.078 | -.705 | .483 |
| MKLARV | -.774 | .816 | -.111 | -.949 | .346 |
| MVR20M | -18.705 | 16.484 | -.130 | -1.135 | .261 |

a Dependent Variable: MKGJVR

In table no. 2 are presented values, which as criterion is taken the MKGJVR variable of the dimensions of the basic motor of the predictor system and criterion variables. By sig. .000 based on the multiple correlation coefficient ($R_o = .651$) can be explained that 42.3% of the common variability of the predictor system and the variable criteria. The remaining

of 57.7% is under the influence of unknown factors and not included in this paper. Based on the obtained values, it has been confirmed that the predictor system variable MTRHV has a statistically significant impact on the criterion variable MKGVV with value (**Sig .000**).

Table 3. Regression analysis of the variable MVR60M

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
|-------|------|----------|-------------------|----------------------------|-----------------|----------|-----|-----|---------------|
| 1 | .672 | .452 | .395 | .4989 | .452 | 7.894 | 7 | 67 | .000 |

a Predictors: (Constant), MVR20M, MHMEDC, MKVD, MKLARV, MTRHV, MKVGJ, MKVM

ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|-------|-------------|
| Regression | 13.757 | 7 | 1.965 | 7.894 | .000 |
| Residual | 16.680 | 67 | .249 | | |
| Total | 30.436 | 74 | | | |

a Predictors: (Constant), MVR20M, MHMEDC, MKVD, MKLARV, MTRHV, MKVGJ, MKVM

b Dependent Variable: MVR60M

Coefficients

| Variables | B | Std. Error | Beta | t | Sig. |
|------------|-------|------------|-------|--------|-------------|
| (Constant) | 7.499 | 1.798 | | 4.170 | .000 |
| MKVGJ | .005 | .005 | .162 | 1.226 | .225 |
| MTRHV | -.005 | .002 | -.375 | -3.026 | .004 |
| MKKVD | .003 | .005 | .084 | .678 | .500 |
| MKKVM | -.003 | .006 | -.075 | -.556 | .580 |
| MHMEDC | -.006 | .001 | -.074 | -.687 | .494 |
| MKLARV | .003 | .013 | .031 | .270 | .788 |
| MVR20M | 1.209 | .266 | .510 | 4.552 | .000 |

a Dependent Variable: MVR60M

In table no. 3 are presented values, where as a criterion is taken variable MVR60M of the motor dimen-

sions of the three athletic disciplines of the predictive motor system of the criterion variables. By sign.

.000 based on the multiple correlation coefficient ($R_o = .672$) can be explained by 45.2% of the common variability of the prediction system and the variables criterion. The remaining 54.8% is under the influence of unknown factors and not included in this paper. Based on the obtained values it is proved that the MVR60M variable of the prediction system has a statistically significant impact on the criterion variable MTRVV with value (**Sig. .004**). Also valuable statistical impact has given variable MVR20M with value (**sig.000**).

CONCLUSION

The research aimed to determine the impact of the basic motor skills (of the explosive force of the low-

er and upper extremities, etc.), at the 16 year old students, in the performance of the results in two athletic disciplines (60 meters running and speedy long jump). In total, 9 basic and situational motor skills variables were applied.

Based on the results and values of the regression analysis, it is noted an important influence on the result of the speedy long jump with ($R_o = .651$) for the significance level of $p < 0.001$ and in the running result of 60 m with ($R_o = .672$) for the level of significance of $p < 0.001$ and $p < 0.005$. The obtained results confirm previous similar studies which addressed the problem of motor skills impact on results in some athletic disciplines.

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PUPILS ASSESSMENT OF SPORTS PEDAGOGY SPEEDS WITHIN THE MODULE "BETWEEN DISCIPLINES" AS A FACTOR OF INTERIOR RELATIONS

Husejn Musić

Abstract:

The experience in the teaching practice indicating on the relationship between pupils and sport's pedagogues, are not as should be, therefore, resulting in the negative reflection on the quality and outcomes of the educational process. Frequent misunderstandings, conflicts in communication, interaction between pupils and sport's pedagogues, were strong arguments to thoroughly investigate these issues. Specifically, the investigation of the sport's pedagogue's qualities in the framework modalities "attitude towards discipline", as a factor of the relationship with pupils, had an aim to actualize the importance of this issue in the educational process, make it every day subject assessment, continues work and as a result there is the democratization of the relationship between direct factors as well as improvement of the entire educational process.

Keywords: educational process, sport's pedagogue, qualities

INTRODUCTION

Changes in society, educational activities, science, technology did not significantly affect the teacher's being and not being an inevitable person and an immediate factor of teaching. Plato's thought delivered over two thousand and five hundred years ago, which reads:

"The state will not do much harm if the shoemaker does not have a clue about his craft, but if teachers fail to fulfill their obligations, then they will create a generation of ignorant and married people who will ruin the future of the fatherland" (according to Džaferović, Dž.Ž., 1968: 347). To some extent, it absolutates the role of teachers, it is to a certain extent true and current, even today, because the movements in society still largely depend on the creativity of young generations, their proper education and education. Teacher-teacher (teacher Lehrer, Russian teacher) - "a person recognized by society and educational authorities as being qualified for the education and training of children, youth and elderly" (Pedagogical Encyclopedia, 1989: 103). In some countries they are called teachers and teachers, and in second-level schools, analyzing rich pedagogical heritage, we have observed different terms for people who are educating and educating.

Sumer teachers called the minds (brother, friend, elderly man who teaches), the Hebrew rabbi (teacher, Jewish priest, scholar, scholar), the old Athenians didaskali (didaskalija-nauk) and the Greek grammatikus, but somewhat later The Romans come up with the term pedagogue (paidagogos, paidos-child, boy, and age-guide). The teacher is a professionally-educated person for the planning, preparation and execution of a didactic-methodically based, complex and dynamic teaching, or the entire educational work in a school or other pedagogical institution, (Group of Authors, 1999: 97). Having in mind the above definition, we find that the teacher in the educational process performs various activities.

The teacher acts, teaches, educates, educates, plans, programs, prepares, realizes, explains, shows, instigates, engages, demonstrates, interprets, demands, analyzes, synthesizes, generalises, checks, evaluates, evaluates, In this sense, the teacher is still the leading factor in the teaching process, because it reveals and explains scientific truths. With their pedagogical, didactic-methodical skills, they motivate students to activate themselves more actively in the process of teaching thoughtfully.

In the process of realizing content activities, the teacher enables students to independently view, perceive, analyze and synthesize, generalize, acquire images, memorize, comprehend and understand, understand causation-related relationships, make conclusions, give definitions, evaluate, evaluate, evaluate. The teacher asks the students to participate in the preparation, plundering, programming, realization, verification and evaluation of the results of teaching work and free activities.

Theoretical approach to the problem

The pedagogue of sport as a factor of student relationship

We can define relationships in school as the interaction effects that occur between learners during school life and work. From the stated definition of relations in school we can conclude that the specificity of educational work is based on the quality of the established relationship between the factors of the teaching process, in our case it is about activity and relation to the relations between the pedagogue of sports and pupils, students and students, teachers and teaching content , students and teaching content with interaction.

When these activities become aware, intended for partners, for pupils and teachers who are recruited as direct participants in the educational process, when they carry certain definitions, the communication-interaction impacts form the basis of the rela-

tionship between the direct participants of the teaching and other activities in the school.

In our work, the relationship between pupils and pedagogues of sports is shortly defined as their interdependent perception, experiencing, reacting and acting in mutual contacts and interactions in the process of teaching, school and beyond.

In our work, we will define pedagogues as educators in the field of sports, educators, trainers, experts who plan, prepare, program, monitor, measure, evaluate, direct, manage the process, assist students in learning and be responsible for the outcomes of the educational process, realizes the plan and program of the planned contents and activities in the field of sports, physical and health education, and we consider it necessary to put a special emphasis on its characteristics in the context of studying the relationship between pupils and pedagogues of sport within the modality of "attitude towards discipline".

Modern civilization changes require a completely different person in the face of a sports pedagogue, which should be primarily: educator, associate, leader, organizer, coordinator, experimenter, practitioner, mentor, advisor, planner, programmer, innovator, lecturer, assessor, diagnostician, expert educated person, to have love for children, and so on. The aforementioned qualities of sports pedagogue can be supplemented by broad general culture, pedagogical education, love for their vocation and children, constant aspiration for professional development, etc. which are necessary for the process of education itself and thus determine the building of adequate relationships between students and teachers.

METHODOLOGY OF WORK

Problem, Objective, Objective and Task of Research

The problem of our research was to study and investigate the modality of "attitude towards discipline" within the framework of the personal characteristics of the pedagogue of sport as a factor of the relationship that influences the quality of the educational process, efficiency, communication, interaction and relations between direct factors. The subject of our research was to investigate, study and analyze the presence, display modalities of attitudes towards discipline, the characteristics of pedagogues of sports that significantly determine relationships with students, and disorders that determine conflicts and misunderstandings.

Our aim was to identify the presence of the most common indicators of modality, attitudes towards discipline, the characteristics of the pedagogue of sports that determine the relations with students during the educational process, and the task of determining whether there are significant deviations in the use of instruments and the processing of the obtained results. the empirical and expected

frequencies of the assessment of pupils of rural, suburban and city schools of indicators of modality, attitude towards discipline, the characteristics of pedagogues of sports that determine relations with students.

Research hypothesis

In the hypothesis in our research, we assumed that the random deviations of the empirical ones from the expected frequencies in the results of assessments of pupils of rural, suburban and city schools of modalities of attitudes towards the discipline of the personal characteristics of the pedagogue of sports that determine the relations between the direct factors in the educational process.

Methods, techniques and research instruments

In this research work we applied the following methods of research: the method of theoretical analysis, the method used and the descriptive method. In order to obtain concrete data that were relevant to our research problem, we used scaling techniques, analysis of pedagogical documentation, compilation and statistical data processing. The scale of the assessment we have built up determined the attitudes, opinions, frequencies, the students' assessment of the presence of the indicators of the modality, attitude towards discipline, the characteristics of the pedagogue of sports.

Population and sample of respondents

The population of our research was made up of students of the 7th grade of elementary schools in the Eastern part of the city and the municipalities of Mostar in Herzegovina-Neretva Canton. The eastern part of the city and municipalities of Mostar covers 22 primary schools with about 9971 pupils deployed in grades I-VIII. 933 pupils attend classes in grade VII. The sample of the survey included students from three city, suburban and rural schools, and the total number of students enrolled was 471 or 50.48, which means that each other pupil of the 7th grade is included in the research. Since the sample is neither too large nor too small, we used a percentage with a percentage in the research, because we thought we would get results that could give a fairly safe picture and point out the essential characteristics of the relationship between pupils and pedagogues of sports in the educational process.

RESULTS OF RESEARCH

In our empirical research, the task was to analyze the indicators of pupils' assessments in rural, suburban and city schools, ascertaining the existence of differences in the frequency of assessing the presence of modalities indicators, attitude towards discipline, the personality characteristics of the peda-

gogue of sports that determine relationships with students.

The assessment of the indicators of the modality "attitude towards discipline" of the characteristics of the pedagogue of sports was carried out by the students with a scale of assessment where they assessed the presence and manifestation of the indicators of the said modalities in the teaching process, so that the sign "X" or in some other way declared in the envisaged space the frequency of manifestation in the cells: for all teachers-A, for most teachers-B, I can not estimate-C, for a smaller number of teachers-D and for no teacher-E. The students' answers were scored in cells A = 5, B = 4, C = 3, D = 2 and E = 1 point.

In assessing the characteristics of the personality of the pedagogue, the students assessed in the framework of the modalities of "attitudes towards discipline" indicators under number 8: self-determination, primacy, stiffness, 9: objectivity, reliability, 10: optimism, activity, safety, 16: enthusiasm, optimism, consistency, security, 17: indifference, pessimism, 19: inconsistency, irresponsibility, 20: falsehood, stubbornness, inertness, 23: inclination of gossip, defamation and lies, 24: understanding, respecting oneself and others, 31: patience, , 35: Mobility and Interest.

The results of the assessment of the pupils of the characteristics of the pedagogue of sport within the modality "attitude towards discipline" are presented in Table 1.

Table 1. Results of student assessment of indicators of personal characteristics of sports pedagogue modality, attitude towards discipline

| City, suburban and rural schools - collectively | | | | | | | | | | | | | | | | |
|---|------------------------|--|------|------|------|------|------|------|------|-----|-----|-----|-----------|-------|-------------|------|
| No. | I N D I K. | Pedagogical Features: The attitude of sports pedagogue to discipline | | | | | | | | | | | | | | |
| | | A | | B | | C | | D | | E | | SV | SV bod | M | st. dev. | rang |
| | | f | fx5 | f | fx4 | f | fx3 | f | fx2 | f | fx1 | | | | | |
| 1 | 8 | 52 | 260 | 131 | 524 | 133 | 399 | 112 | 224 | 43 | 43 | 471 | 1450 | | | 3 |
| 2 | 9 | 47 | 235 | 128 | 512 | 112 | 336 | 129 | 258 | 55 | 55 | 471 | 1396 | | | 5 |
| 3 | 10 | 28 | 140 | 138 | 552 | 120 | 360 | 119 | 238 | 66 | 66 | 471 | 1356 | | | 7 |
| 4 | 16 | 26 | 130 | 113 | 452 | 118 | 354 | 138 | 276 | 76 | 76 | 471 | 1288 | | | 8 |
| 5 | 17 | 56 | 280 | 127 | 508 | 119 | 357 | 112 | 224 | 57 | 57 | 471 | 1426 | | | 4 |
| 6 | 19 | 74 | 370 | 133 | 532 | 110 | 330 | 94 | 188 | 60 | 60 | 471 | 1480 | | | 1 |
| 7 | 20 | 63 | 315 | 135 | 540 | 122 | 366 | 108 | 216 | 43 | 43 | 471 | 1480 | | | 1 |
| 8 | 23 | 62 | 310 | 137 | 548 | 119 | 357 | 106 | 212 | 47 | 47 | 471 | 1474 | | | 2 |
| 9 | 24 | 42 | 210 | 120 | 480 | 132 | 396 | 113 | 226 | 64 | 64 | 471 | 1376 | | | 6 |
| 10 | 31 | 31 | 155 | 102 | 408 | 119 | 357 | 149 | 298 | 70 | 70 | 471 | 1288 | | | 8 |
| 11 | 35 | 34 | 170 | 92 | 368 | 124 | 372 | 144 | 288 | 77 | 77 | 471 | 1275 | | | 9 |
| | SV | 515 | 2575 | 1356 | 5424 | 1328 | 3984 | 1324 | 2648 | 658 | 658 | 471 | 15289 | 32,46 | 10,79 | |

In the aggregate table of the results of the assessment of the indicators of modality "attitude towards the discipline" of pupils of rural, suburban

and city schools, they declared themselves present in the following way:

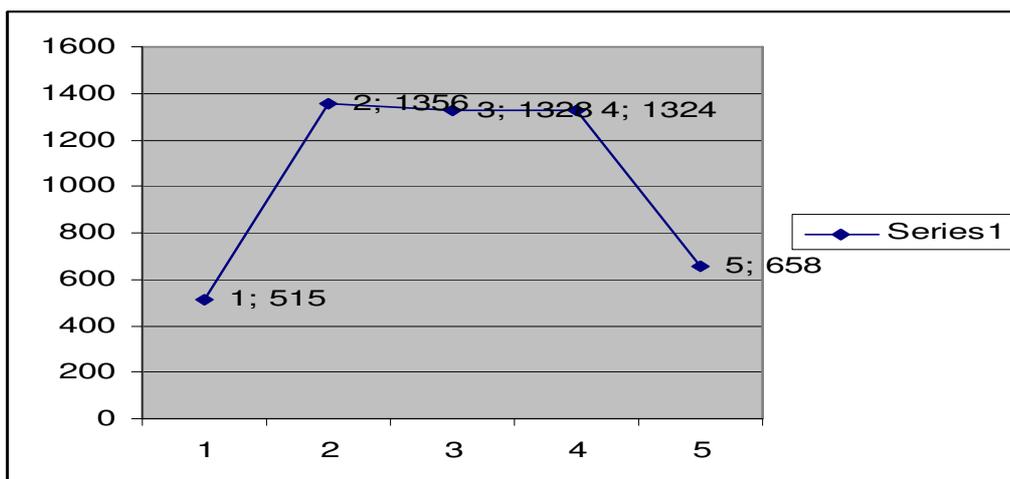
| | |
|-----------------------------------|-----------------------|
| with all teachers | 515 (9.94%) |
| for most teachers | 1356 (26.17%) |
| I can not assess | 1328 (25.635) |
| with a smaller number of teachers | 1324 (25.555) |
| with no teachers | 658 (12.705) students |

The assessment of the frequency of the manifestation of the characteristics of the pedagogue of sports within the modality of "attitude towards discipline" in teaching practice determines the conclusion that their presence in all and most of the teachers has been identified, in 36.11 cases; with a smaller number and no teacher

38.25; 25.63 students answered that they could not evaluate the indicators and identify this modality in teaching practice.

The frequency of the students' estimation of frequency in the emission of indicators within the given modality, on the characteristics of teachers, was shown in Chart 1.

Chart 1: Frequency of assessment of pupils of modalities indicators, paragraph pedagogue of sport according to discipline



The distribution of the frequency of the results of a student's assessment of the modalities of the "teacher's attitude towards discipline" is positively-asymmetric, i.e. that in the work of the majority of teachers with students, in the realization of program contents and activities, in teaching and free activities, the characteristics dominate (indifference, pessimism, inconsistency, irresponsibility, tendency to gossip, libel and lying, then powerlessness, primacy and stiffness) which negatively affect on the quality of relationships between students and teachers. It should be noted that the presence of certain negative characteristics expressed through the indicators is generally high in the category "in

most cases, and in relation to the positive ones, they are dominant as shown in Chart 1.

Our task of the research was to determine whether there is a statistically significant difference between the obtained empirical frequencies from the expected, estimated faces of the pedagogue of sport modality, the attitude of the sports pedagogue to discipline, by calculating the value of the Hi-square test.

The calculated values of the Hi-square test, the frequency of the students' assessment of the modalities of the attitudes, the attitude of the sports pedagogue towards discipline, are shown in Table 2.

Table 2. The features of pedagogy - the attitude of a pedagogue of sport to discipline-value χ^2

| Schools | A | | B | | C | | D | | E | | SV | χ^2 | df |
|----------|-----|-----|------|-----|------|-----|------|-----|-----|-----|------|----------|----|
| | f0 | ft | f0 | ft | f0 | ft | f0 | ft | f0 | ft | | | |
| rural | 210 | 165 | 444 | 435 | 430 | 426 | 394 | 424 | 183 | 211 | 1661 | 1,67 | |
| suburban | 147 | 174 | 451 | 458 | 396 | 448 | 486 | 447 | 269 | 222 | 1749 | 2,15 | |
| city | 158 | 176 | 461 | 464 | 502 | 454 | 444 | 453 | 206 | 225 | 1771 | 0,79 | |
| SV | 515 | | 1356 | | 1328 | | 1324 | | 658 | | 5181 | 4,61 | 8 |

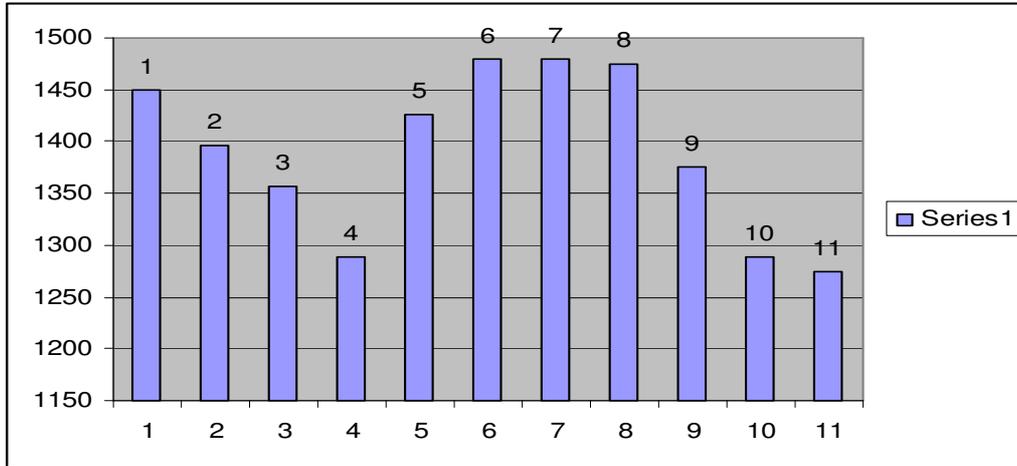
The calculated value $\chi^2 = 4.61$ at the significance level of 0.05% does not exceed the limit value $\chi^2 = 15.50$ for $df = 8$ degrees of freedom, indicates that the deviations in the assessment of pupils of the modalities indicator of the attitude of the sports pedagogue to the discipline in the frequencies expected, they are random. At the significance level of 0.01 the calculated value $\chi^2 = 4.61$ is less than the limit value $\chi^2 = 20.09$, for $df = 8$ degrees of freedom, which means that the difference in pupils' estimates between the empirical and theoretical frequencies at this level is not statistically significant, that the expected deviations are expressed in the frequen-

cies of the students' assessment of the modalities of the attitudes of the sports pedagogue towards discipline. Based on the presented indicators, the students' assessment of the attitude of the sports pedagogue to discipline and the calculated values of the χ^2 test confirmed our hypothesis by assuming that the random deviations of the empirical ones from the expected frequencies in the results of the assessments of pupils of rural, suburban and city school indicators, the attitude of the sports pedagogue to the discipline of the modality of personal qualities as a factor in the relationship in the educational process, that is, the majority of the students

assessed that in the teaching practice of elementary schools the characteristics of teachers are more dominant, which does not encourage the establishment of democratic relations in the educational

process. The cumulative results of the assessment of pupils of rural, suburban and city schools, indicators of the "attitude of teachers towards discipline", were presented in Chart 2.

Chart 2: Assessment of students' modalities of attitudes, attitude of sports pedagogue to discipline



According to the students' assessment of the modalities of the attitude towards discipline, according to the intensity and the presence in the first rank, the characteristics of pedagogues of sports under the number 6 and 7, that is, indifference, pessimism, inconsistency and irresponsibility, are included. The second rank occupies the qualities under number 8. That is, the tendency to gossip, defamation and lying. In the third rank, the qualities are evaluated under the serial number 1. i.e. the qualities of teachers are self-centered, principled, and cruel. The last ninth ranking according to the assessment of pupils of rural, suburban and city schools, occupies the characteristics of pedagogues mobility and interest under number 11.

the modality "attitude of the teacher towards discipline" on the characteristics of the personality of the pedagogue of sports expressed through frequency in the expression of positive and negative characteristics of teachers, statistically processed, graphically in the following tables. Within the modality, the attitude of sports pedagogue towards discipline, students of rural, suburban and city schools carried out an assessment of the indicators of positive characteristics of teachers, under the following serial number 9: objectivity, reliability; 10: optimism, activity, security, 16: enthusiasm, optimism, consistency, security, 24: understanding, respecting oneself and others, 31: patience, consideration, justice, 35: mobility and interest. The results of the students' assessment of the positive characteristics of the sports pedagogue are shown in Table 3.

The task of our research was to determine whether there is a statistically significant difference in the frequency of the assessment of pupil indicators in

Table 3: Assessment of pupils' indicators to the modality, attitude of sports pedagogue to discipline - positive traits

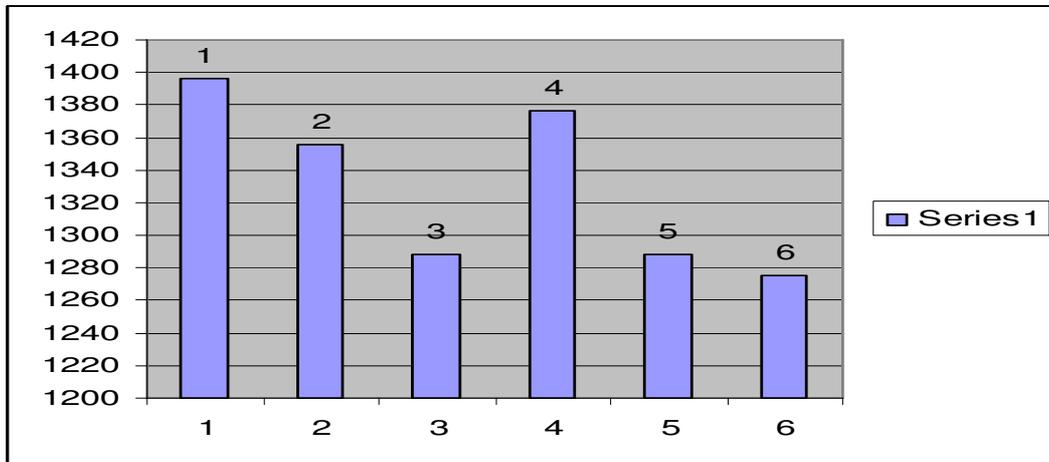
| City, suburban and rural schools - collectively-positive traits | | | | | | | | | | | | | | | | |
|---|------------------------|--|------|-----|------|-----|------|-----|------|-----|-----|-----|--------|-------|----------|------|
| No. | I N D I K. | Pedagogical Features: The attitude of sports pedagogue to discipline | | | | | | | | | | | | | | |
| | | A | | B | | C | | D | | E | | SV | SV bod | M | st. dev. | rang |
| | | f | fx5 | f | fx4 | f | fx3 | f | fx2 | f | fx1 | | | | | |
| 1 | 9 | 47 | 235 | 128 | 512 | 112 | 336 | 129 | 258 | 55 | 55 | 471 | 1396 | | | 1 |
| 2 | 10 | 28 | 140 | 138 | 552 | 120 | 360 | 119 | 238 | 66 | 66 | 471 | 1356 | | | 3 |
| 3 | 16 | 26 | 130 | 113 | 452 | 118 | 354 | 138 | 276 | 76 | 76 | 471 | 1288 | | | 4 |
| 4 | 24 | 42 | 210 | 120 | 480 | 132 | 396 | 113 | 226 | 64 | 64 | 471 | 1376 | | | 2 |
| 5 | 31 | 31 | 155 | 102 | 408 | 119 | 357 | 149 | 298 | 70 | 70 | 471 | 1288 | | | 4 |
| 6 | 35 | 34 | 170 | 92 | 368 | 124 | 372 | 144 | 288 | 77 | 77 | 471 | 1275 | | | 5 |
| | SV | 208 | 1040 | 693 | 2772 | 725 | 2175 | 792 | 1584 | 408 | 408 | 471 | 7979 | 16,94 | 34,03 | |

In Chart number 3, we presented the results of the student's assessment of the modality, "the attitude

of the teacher towards discipline", the positive characteristics of the teachers they demonstrate in

teaching practice.

Chart 3: Assessment of students' modalities of attitudes, attitude of sports pedagogue to discipline - „positive characteristics“



According to pupils' assessment, the highest frequency and intensity of manifestation in the educational process are the characteristics of the pedagogue of sport, objectivity and reliability, and occupy the first rank. In the second ranking according to the frequency in emulation, the qualities are under the number four understandings, respect for oneself and others, and the third rank occupies the quality of teachers optimism, activity, security.

The last ranking of positive features that were assessed by students, takes up the mobility and interest of pedagogues. In the framework of the modalities

of the "attitude of teachers towards discipline," the students evaluated the indicators of the negative characteristics of teachers under number 8: self-determination, primacy, stiffness, 17: indifference, pessimism, 19: inconsistency, irresponsibility, 20: inertness, 23: the inclination of gossip, slander and lies.

The cumulative results of the pupil's estimation of frequency in expressing the negative characteristics of teachers in teaching practice are shown in Table 4.

Table 4: Assessment of students' negative characteristics of sports modalities "attitude towards discipline"

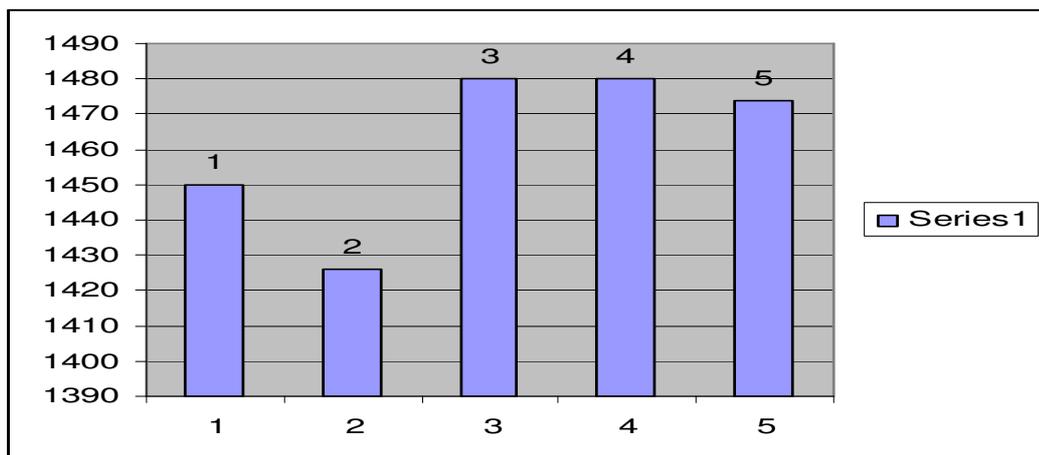
| City, suburban and rural schools - collectively-negative traits | | | | | | | | | | | | | | | | |
|---|------------------------|--|------|-----|------|-----|------|-----|------|-----|-----|-----|--------|-------|----------|------|
| No. | I N D I K. | Pedagogical Features: The attitude of sports pedagogue to discipline | | | | | | | | | | | | | | |
| | | A | | B | | C | | D | | E | | SV | SV bod | M | st. dev. | rang |
| | | f | fx5 | f | fx4 | f | fx3 | f | fx2 | f | fx1 | | | | | |
| 1 | 8 | 52 | 260 | 131 | 524 | 133 | 399 | 112 | 224 | 43 | 43 | 471 | 1450 | | | 3 |
| 2 | 17 | 56 | 280 | 127 | 508 | 119 | 357 | 112 | 224 | 57 | 57 | 471 | 1426 | | | 4 |
| 3 | 19 | 74 | 370 | 133 | 532 | 110 | 330 | 94 | 188 | 60 | 60 | 471 | 1480 | | | 1 |
| 4 | 20 | 63 | 315 | 135 | 540 | 122 | 366 | 108 | 216 | 43 | 43 | 471 | 1480 | | | 1 |
| 5 | 23 | 62 | 310 | 137 | 548 | 119 | 357 | 106 | 212 | 47 | 47 | 471 | 1474 | | | 2 |
| | SV | 307 | 1535 | 663 | 2652 | 603 | 1809 | 532 | 1064 | 250 | 250 | 471 | 7310 | 15,52 | 43,68 | |

The frequency of the results of the assessment of pupils of rural, suburban and city schools, the negative characteristics that are displayed in the teachers in teaching and free activities, were converted into points, calculated the arithmetic

mean that is $M = 15.52$, and the standard deviation $\sigma = 43.68$.

In Chart 4 we presented the results of the students' assessment of the negative characteristics of the teacher about the modality "attitude of teachers towards discipline".

Chart 4: Results of the assessment of pupils of the modalities indicators, attitude of the sports pedagogue according to discipline - „negative traits“



According to the student's assessment of the frequency and intensity of manifestation of the negative characteristics of the pedagogue of sport within the modality of "attitude towards discipline", inconsistency, irresponsibility, falsity, stiffness, inertia, under the number three and four that occupy the first rank. The second ranking occupies the qualities under number 5, that is, the characteristics of teachers, the tendency to search and slander. In the third rank are the qualities under the serial number 1. i.e. the qualities of teachers are self-centered, principled, and cruel.

The last fourth ranking according to the frequency estimates of pupils of rural, suburban and city schools are the characteristics of pedagogues of sport indifference and pessimism under the serial number 2.

In Table 5, the table shows the cumulative frequencies of students' assessments of the positive and negative characteristics of the modality, the attitude of the sports pedagogue towards discipline.

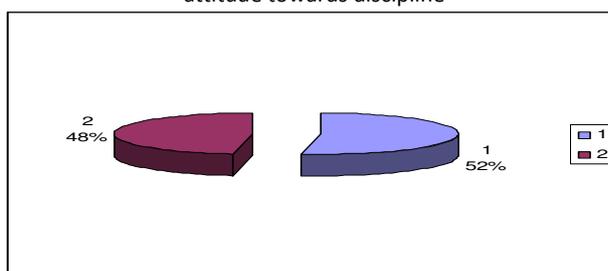
Table 5: Frequency estimates of pupils of positive and negative modalities "the attitude of sports pedagogue to discipline"

| Urban, suburban and rural schools - Collective results - positive and negative characteristics | | | | | | | | | | | | | | | | |
|--|------------------------|---|------|-----|------|-----|------|-----|------|-----|-----|-----|--------|-------|----------|------|
| No | I N D I K. | Pedagogical Features: The attitude of teachers towards discipline | | | | | | | | | | | | | | |
| | | A | | B | | C | | D | | E | | SV | SV bod | M | st. dev. | rang |
| | | f | fx5 | f | fx4 | f | fx3 | f | fx2 | f | fx1 | | | | | |
| 1 | poz | 208 | 1040 | 693 | 2772 | 725 | 2175 | 792 | 1584 | 408 | 408 | 471 | 7979 | 16,94 | 34,03 | 1 |
| 2 | neg | 307 | 1535 | 663 | 2652 | 603 | 1809 | 532 | 1064 | 250 | 250 | 471 | 7310 | 15,52 | 43,68 | 2 |

The results of the assessment of the pupil indicators of positive and negative characteristics of the indica-

tors in the modality "attitude of the teacher according to discipline" are presented in Chart 16.

Chart 5: Assessment of students' positive and negative characteristics of pedagogues of sports modality "attitude towards discipline"



In this table and Graph 5 we present the estimates of students' positive and negative characteristics of the pedagogue of sports within the modality of the

attitude of the teacher towards discipline, and we note that somewhat greater presence of positive (52.00%) than negative (48.00%) the characteristics

of the pedagogue of sports in the educational

CONCLUSION

On the basis of obtained results of the research on pupils' assessments of the characteristics of the personality of sports pedagogues expressed through the presence of indicators of the modality "attitude towards discipline", we have come to the following conclusions to calculate the value of differences in the arithmetic meanings of students' estimates of negative and positive characteristics of pedagogue sports modality, attitude towards discipline, $DM = 1.42$, and the standard error of arithmetic mean difference is $SEDM = 2.54$. The calculated t-value is 0.55 and for $df = 940$ at the significance level 0.05% is 1.96; on the basis of which we conclude that there is no statistically significant difference in the assessment of pupils of negative and positive characteristics of teachers of the modality "human qualities of teachers" at a level of significance of 0.05% with 940 degrees of freedom. By calculating the values of χ^2 and t-values, we did not find significant deviations from the estimated empirical ones from the expected frequencies, that is, there is no statistically significant difference in the

process.

assessment of the presence of students in the expression of the indicators of this modality, thus establishing that we have confirmed our hypothesis that it was: significant deviations in the estimation of empirical predictions from the expected frequencies and statistically significant difference in the assessment of pupils of modalities indicators, the attitude of sports pedagogue to discipline as a factor of the relationship between factors in the educational process.

The dominant characteristics of the pedagogue of sport (indifference, pessimism, inconsistency, irresponsibility, tendency, slander, lying, self-control, primacy and stiffness) assessed by pupils of rural, suburban and city schools within the modality of attitude of sports pedagogue towards discipline often determine subordinate, autocratic, inhuman, chief, repressive, conformist, rigid, distrustful, hierarchical relationships between pupils and teachers with a distinct teacher domination, who are largely insufficiently pedagogically stimulating, demotivating, followed by coercion, physical punishment, disdain, discomfort, tension and monotony working atmosphere.

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ANALYSIS OF QUANTITATIVE CHANGES OF RESEARCHED ANTHROPOLOGICAL SPACES IN BASKETBALL PLAYERS AT JUNIOR AGES

Azer Korjenić, Emir Spahalić, Samir Lerić

Abstract

For the purpose of improving young basketball players quality of playing and aim of gaining situational efficiency, behind basic fitness training, it is necessary to practice and provide as many situational games (game with two baskets), because training methods are building up and developing specific situational elements of basketball game. The aim of this research is to determine the effects training model on the transformation of morphological characteristics of young junior basketball players.

Keywords: basketball, transformations, situational training, training process, junior age

INTRODUCTION

Necessity of researching linked to this topic, it is special refers to transformation morphological characteristics, motorics and situational-motoric skills of basketball players junior ages, under the influence applied program of situational training. It was necessary to research, find and get important informations that can greatly improve training process of basketball players, and as a final result to have a positive impact to overall anthropological status of them same, so as improve situational efficiency in basketball. So, basketball as an integral part of the wide area physical education and sport doubtless presents at the same time and tool for energetic-motoric and intellectual activity. From the point of movement and the structure of the game situation, basketball is one the most complex team where fast transformations from action to action are dominating, what actually necessary leads to transformations in anthropological status of participants of basketball.

TECHNIQUE OF SCIENTIFIC WORK

This research has a longitudinal character in order to be in time different two points determine the transformation changes of anthropological status of basketball players junior ages under situational basketball training impact at a certain pattern examiner.

Sample of examiners

Population from which it was pulled out of the sample entities for this research, it was defined such as sample of young basketball players junior ages (from 16 to 18 ages), who play and train in next basketball clubs in Herzegovina: KK „Brotinjo“ from Čitluk, , KK „Čapljina“ from Čapljina, OKK „Mostar 05“ from Mostar, KK „Ljubuški“ from Ljubuški and KK „Turbina“ from Jablanica.

Due to submitted datas and founded number of named clubs and players, there was included 102 subjects, who trained regularly and competed for their clubs in planned researching time. There was no

additional limiting conditions regarding the validity of the sample.

Sample of variables

Morphologically access was covered with the next variables: body height (BH), length hands (LH), weight (W), wrinkle of subcutaneous fat on the back (WSCFOTB), wrinkle of subcutaneous fat on the upper arm (WSCFOTU), wrinkle of subcutaneous fat on the stomach (WSFOTS), wrinkle of subcutaneous under knee (WSUK), volume of upper arm (WOUA), volume of thorax (VOT), volume of upper knee (VOUK) and volume of under knee (VOUK).

Measurements are done due to International biological program-IBP instructions. Selected tests are satisfying metric characteristics, they are standardized, previously calibrated, daily controlled before using and published in publications.

RESULTS AND DISCUSSIONS

In order to determine quantitative differences, actually partial quantitative effects of changes resulted under the influence of applied situational training program in basketball, in relationship results of initial and final measurements 102 examiners, basketball players junior ages, it is applied univariate level of testing (T-test for depended samples).

Analysis of quantitative changes in researched anthropological spaces is done during three individual sections applying by T-test because of the same transparency and better analysis of datas.

Analysis quantitative changes of researched morphological characteristics basketball players junior ages

Analysis quantitative changes 12 researched morphological characteristics of 102 basketball players junior ages resulted under applied training program influence of situational training method, is done we already said by T-test.

From resulted arithmetic means value of results researched morphological characteristics, on initial and final measurement, then on basis of importance changes (differences found) tested by T-test for dependent samples (Table 25), it is clearly to see

that applied program situational training in basketball in its own bigger part produced statistic im-

portant partiant quantitative effects, it means changes in postive way.

Table 1. Quantitive changes of researched morphological characteristics

| Variables | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|-----------|-----------|--------------------|----------------|-----------------|---|----------|---------|-----|-----------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| P1 | ATVIS – F | -,20588 | ,62280 | ,06167 | -,32821 | -,08355 | -3,339 | 101 | ,001 |
| P2 | TETEZ – F | ,75882 | 1,52928 | ,15142 | ,45845 | 1,05920 | 5,011 | 101 | ,000 |
| P3 | DŽRUK – F | -3,38235 | 4,41205 | ,43686 | -4,24896 | -2,51574 | -7,742 | 101 | ,000 |
| P4 | RARUK – F | -1,97549 | 3,66507 | ,36290 | -2,69538 | -1,25560 | -5,444 | 101 | ,000 |
| P5 | OGRKO –F | -1,14216 | 2,02139 | ,20015 | -1,53920 | -,74512 | -5,707 | 101 | ,000 |
| P6 | ONADL –F | -2,44412 | 2,37331 | ,23499 | -2,91028 | -1,97796 | -10,401 | 101 | ,000 |
| P7 | ONKOL –F | -,76471 | 1,28884 | ,12761 | -1,01786 | -,51155 | -5,992 | 101 | ,000 |
| P8 | OPOKL –F | ,20784 | 2,20525 | ,21835 | -,22531 | ,64099 | ,952 | 101 | ,343 |
| P9 | KNLEĐ –F | ,10961 | ,20222 | ,02002 | ,06989 | ,14933 | 5,474 | 101 | ,000 |
| P10 | KNNDL –F | ,11039 | ,15396 | ,01524 | ,08015 | ,14063 | 7,241 | 101 | ,000 |
| P11 | KNTRB –F | ,22667 | ,22799 | ,02257 | ,18189 | ,27145 | 10,041 | 101 | ,000 |
| P12 | KNPTK - F | ,18196 | ,22433 | ,02221 | ,13790 | ,22602 | 8,192 | 101 | ,000 |

From results, it can be assumed that applied program situational training in basketball caused statistic important changes in all variables, used for assesment morphological space, except in variable OPOKL- volume of under knee (Sig=343).

Analysis of quantitative changes researched motoric capabilities basketball players junior ages

It is done analysis quantitative changes 12 variables in further processing of datas, which we used for assesment researched motoric status 102 basketball players junior ages. The aim of this analysis was to determine quantitative changes under researched motoric space under influence applied training program in basketball, and in the same purpose is also used statistic- mathematic method of T-test.

Table 2. Quantitive changes of researched motoric capabilities

| Varijables | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|------------|-------------|--------------------|----------------|-----------------|---|----------|---------|-----|-----------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| P 1 | MVTAP - F1 | -3,38235 | 3,75498 | ,37180 | -4,11990 | -2,64480 | -9,097 | 101 | ,000 |
| P 2 | MVTAN - F2 | -2,56863 | 2,90275 | ,28741 | -3,13878 | -1,99847 | -8,937 | 101 | ,000 |
| P 3 | MVPZD - F3 | -1,57843 | 2,37744 | ,23540 | -2,04540 | -1,11146 | -6,705 | 101 | ,000 |
| P 4 | MVFIP - F4 | 4,02941 | 6,65628 | ,65907 | 2,72199 | 5,33683 | 6,114 | 101 | ,000 |
| P 5 | MVDUS - F5 | -10,86275 | 7,59369 | ,75189 | -12,35429 | -9,37120 | -14,447 | 101 | ,000 |
| P 6 | MVDST - F6 | -7,22549 | 7,29968 | ,72278 | -8,65928 | -5,79170 | -9,997 | 101 | ,000 |
| P 7 | MESDM - F7 | -4,25490 | 8,48608 | ,84025 | -5,92173 | -2,58808 | -5,064 | 101 | ,000 |
| P 8 | MVSAR - F8 | -4,44118 | 6,01578 | ,59565 | -5,62279 | -3,25957 | -7,456 | 101 | ,000 |
| P 9 | ME20V - F9 | ,08569 | ,13142 | ,01301 | ,05987 | ,11150 | 6,585 | 101 | ,000 |
| P10 | MVSKL - F10 | -2,51961 | 4,84764 | ,47999 | -3,47177 | -1,56744 | -5,249 | 101 | ,000 |
| P11 | MVDTL - F11 | -2,42157 | 6,24331 | ,61818 | -3,64787 | -1,19527 | -3,917 | 101 | ,000 |
| P12 | MVBML - F12 | -,61824 | 1,28319 | ,12705 | -,87028 | -,36619 | -4,866 | 101 | ,000 |

From resulted arithmetic means reserched of researched motoric variables in a researched sample of basketball players junior ages examiners, on ini-

tial and final measurement, then on the basis of statisttical signifiacnce occurred changes (differences) tested by T-test for dependent samples (ta-

ble 26), it is clearly seeing that applied program of situational training from basketball resulted with statistic important partial quantitative effects, actually changes. Examining the table 26, clearly t can be concluded that changes resulted in all researched variables under researched motoric space young basketball players junior ages.

Analysis of quantitative changes researched situational-motoric capabilities basketball players junior ages

It is done analysis of quantitative changes 5 variables in further processing datas, which we used for assesment situational-motoric status researched sample examiners basketballplayers junior ages. The aim of this analysis was to determine quantitative changes under researched situational-motoric space under applied situation training influence in basketball and for that purpose is also used statistic-mathematic method of T-test.

Table 3. Quantitive changes of researched motoric capabilities

| Varijables | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---------------|--------------------|----------------|-----------------|---|----------|--------|-----|-----------------|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| P 1 OLT30 – F | -1,45098 | 2,61612 | ,25903 | -1,96484 | -,93712 | -5,601 | 101 | ,000 |
| P 2 DUD2R – F | -,68627 | 1,66490 | ,16485 | -1,01329 | -,35926 | -4,163 | 101 | ,000 |
| P 3 ŠIK30 – F | -,68627 | 1,65894 | ,16426 | -1,01212 | -,36043 | -4,178 | 101 | ,000 |
| P 4 SKVSL – F | 1,75510 | 2,41393 | ,23901 | 1,28096 | 2,22924 | 7,343 | 101 | ,000 |
| P 5 KDŠ30 – F | -1,68627 | 3,03113 | ,30013 | -2,28164 | -1,09090 | -5,619 | 101 | ,000 |

From resulted arithmetic means researched situational-motoric variables at researched sample of basketball players junior ages examiners, on initial and final measurement, and on the situational significance occurred changes (differences) tested by T-test for dependent samples (Table 27), it is clearly seeing that applied program of situational training from basketball resulted with statistic important partial quantitative effects, actually changes, in all researched variables.

From the results we obtained, we can conclude that three month basketball program of situational training, together with playing preparation friendship matches, also with selected contents and volume of work, then qualitatively and appropriate training tools and complications, produced statistic very important positive changes under researched anthropological spaces.

The results show that there has been important improving in all variables researched anthropological spaces, not just in volume of under knee OPOKL - in space of researched morphological characteristics. According to results applied transforming process, changes are realised in all their variables, what will have for a consequence that applied program situational training in whole reflected on positive transformation researched anthropological spaces of basketball players junior ages.

CONCLUSION

In order to determine partial quantitative differences (partial quantitative effects of changes) and particularly for changes in tests for assessment researched anthropological spaces, it is applied univariate level of testing (T-test for dependent samples).

On the basis of the results arithmetic means of researched morphological variables on initial and final measurement for selected sample examiners basketball players junior ages, then on the basis of importance, changes (differences) tested by T-test for dependent samples, it is clearly seeing, that applied program situational training produced statistic important partial quantitative effects (changes) under researched morphological space.

With results of T-test researched morphological characteristics, statistic important differences between initial and final measurement are reached in all researched variables, just not in once, variable volume of underknee (OPK).

On the basis of these and there likely results we concluded that applied program of situational training, produced statistic important partial quantitative effects inside researched morphological space.

With results of T-test researched motoric variables, statistic important difference between initial and final measurement are achieved in all researched variables, so we can conclude that applied program situational training produced statistic important partial quantitative effects inside researched motoric space.

On the basis of the results T-test researched situational-motoric variables statistic important differences between results obtained on initial and

final testing are achieved in all researched variables, so we can conclude that applied program situational training produced statistic important partial quantitative effects inside researched situational-motoric space.

So, according to global assesment qualitat and justification of applied chosen program situational training, we can generally conclude that the same lead to transformation researched antropological spaces basketball players junior ages.

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THE IMPACT OF THE 24 HOUR PROGRAMME FOR PRIMARY SCHOOL OF SWIMMING

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Abstract

The main goal of this research is to explain the impact of the 24 hour programme for primary school of swimming. Respondents for creating this sample are made of 8-10 year old boys, which are active members of school of swimming at „Olimpic pool“ in Sarajevo. Number of respondents from which we got our analysis data is 251 and all of them are male. Each of the respondents is tested individually and results were noted in their booklets. Data processing was done in program SPSS 22.0 for Windows. On univariate level for determination partial quantity differences through two time spots (initial and final state), T-test was made for dependant samples. Programme lasted for 12 days, 24 hours (overall) on daily basis. Programme was implemented on „Olimpic pool“ as said before, 90 minutes every day at afternoon. Temperature of water was around 26-28°C. In this research, results were showing that there was significant progress under the influence of this programme. This 24-hour programme should be suggested to all organizations and individuals who are in elementary/primary school of swimming.

Keywords: students, elementary school of swimming, T-test for dependent samples

INTRODUCTION

Swimming, as one of the healthiest activities, can be done through whole year. Reasons to swim can be for recreation, rehabilitation, or for any kind of competitions. Swimming is popular and it's for everyone (kids, adults, older people or people with disabilities). So far, swimming is not only known as basic motoric skill, but also as good educational content. Knowing to swim can save lives, but also can fulfill biological need to move, and sociological need to hang out with people. Since all of the previous statements aren't questionable, only question is when will trainings start. Results of many researches are showing us that, learning to swim is easier at younger age, mainly because of motoric skills required to learn it, are easier if person is young. Basic of learning from a professional is receiving and implementing knowledge, and after that going to water alone without any help (with note that process of learning should be done through games. Kazazović B. (1998), Grčić-Zubčević, Čulina i Leko (2002), proven on two separate groups of children (8-10 age), which were attending trainings three times weekly, that we can presuppose number of required hours for getting basic swimming skills. Given results shows that after 12 hours of active training, at least 50% students will manage to swim up to 25 meters. More precise data shows that students need around 15 hours of class which is held 3 times per week, or 16 hours is class is done two times weekly. Therefore, number of hours is one of most important elements while learning to swim, Selection of methods for students is a demanding task, and one person who is responsible for final decision is trainer, who takes all elements to his decision (place, details of students, details of group, and previous knowledges).

Findak (1981) divides methods of learning, based on tools available for help, water (shallow or deep), and

way of learning (specific techniques). He noted that within those methods, there are multiple sub-methods and processes which differ by programme used for learning. Method of learning in shallow water was implemented by Halbig, and also got its name from him. Process of learning is divided into three stages. In first stage, students are learning to move in water by practicing those moves outside of water. In second stage, they lean on their backs in shallow water (25-35cm deep) with help of tools, and after without them. In third, and final stage, they lean on their chests. Author notes that advantages of this method are minimal fear while learning and correct breathing tempo, and this method is suggested to also middle-age and older individuals. General informations tell us that on beginning no one was able to swim, and at the end of training approx. 66% of students learned it. So we can say that this programme had positive impact regarding to success chance of learning basic swimming skills. To confirm it we can quote Tortaković (2009), who proved in his research that 12-hour training is efficient for learning. Same author did research on effects on children's general motoric and morphological skills. Based on everything said so far, we can say what is general goal of research, which is to determine effects of 24h programme for elementary school of swimming. We must note that during its realisation, while working with heterogeneous groups, teacher is not in a situation to train everyone equally (speaking of efforts made by individuals) because in those groups there are always individuals with more and less advanced swimming skills. Because of that, teacher must use standard ways of training for everyone in group.

METHODS OF RESEARCH

Respondents sample

Respondent sample for this research was made from males (8-10 year old) which are active students of swimming school at „Olimpic pool“ in Sarajevo. Before coming to swimming school, students did not do any sport activities. Final number of corespondents for making final results of data analysis was 245, and each of them is as said before, male. All corespondents are tested individually and results are noted in their booklets.

Variables sample

Estimation of knowledge was concluded by these criterias (Kazazović B and assistants):

Criteria for reviewing swimming skills are next:

1. Ability to go into water – Is/Isn't able to go into water
2. Ability to get his head wet – Is/Isn't able to go with his head in shallow water
3. Ability to squat underwater – Is/Isn't able to squat underwater
4. Ability to breathe underwater – Is/Isn't able to breathe underwater
5. Ability to float on water while in chest – Is/Isn't able to float on water while on chest
6. Ability to float on water while on back – Is/Isn't able to float on water while on back
7. Ability to slide on chest – Is/Isn't able to slide on chest (3 meters as minimum)
8. Ability to slide on back – Is/Isn't able to slide on back (3 meters as minimum)
9. Ability to jump in shallow water with legs first – Did/didn't jump in shallow water with legs first (150 centimeters)
10. Ability to jump in deep water with legs first – Did/didn't jump in deep water with legs first (250 centimeters)

Criteria for estimating initial and final knowledge of swimming variates from (1) worst to (5) best. (Criteria by Grčić-Zupčević, 1996).

1. Non-swimmer (0-12 meters) – Student who is not willing to come near water or even if he does, he won't go in water. In cases when he goes into water, it's because of pressure of other people or with help of a trainer. After getting into water he walks, not swims. Sometimes he goes in water by his will and he is walking, running, sitting or standing in shallow water. The best try to swim is try to float. After jump into water, he swims with random combination of techniques less than 12 meters.
2. Floater (12.5-24 meters) – After an jump, student swims with any technique less than 24-25 meters.
3. Semi-swimmer (24-33 meters) - After an jump, student swims with any technique less than 33 meters.
4. Beginner-swimmer (33-49 meters) – After an jump, student swims with any technique less than 50 meters.

5. Swimmer (50+ meters) – After an jump, student swims more than 50 meters.

Training programme

Training programme of elementary school of swimming lasted 24 hours over 12 days. It was implemented in „Olimpic pool“ in Sarajevo, every day in afternoon, from 4 PM to 5:30 PM. Water temperature was between 26 and 28°C. Physical education professors made this project possible. All respondents were tested and had same conditions. At the very beginning of training, initial state was determined and at the end, final tests of all respondents were conducted. After determination of initial state students divided into homogeneous groups, each containing 7 students. For estimating swimming knowledge at final testes these terms were used: Is able to go into water, is able to make his head wet, is able to squat underwater, is able to breathe underwater, is able to float on chest, is able to float on back, is able to slip on chest, is able to slip on back. Trainer evaluated all students and gave them marks from 1-5: (1) Non-swimmer, (2) floater, (3) semi-swimmer, (4) beginner-swimmer, (5) swimmer.

Methods of processing data

Data processing was done in computer program SPSS 22.0 for Windows. On univariate level for data determination on partial quantity differences through two time spots (initial and final state), T test was implemented for dependant samples.

RESULTS

Results got from T test for dependent samples under influence of 24-hour programme in primary/elementary swimming school on „Olimpic pool“ in Sarajevo shows clearly that there are significant statistic differences $p < .0000$ in variables which are analysed. Only variable „is able to jump in water“ separates from rest of those, because only in that variable there were no significant difference in initial and final state. While analysing individual variables, we can see these results, table no.3:

1. „Is able to make his head wet“ eta square is 0.02
2. „Is able to squat in water“ eta square is 0.10
3. „Is able to breathe underwater“ eta square is 0.50
4. „Is able to float on chest“ eta square is 0.21
5. „Is able to float on back“ eta square is 0.55.
6. „Is able to slide on chest“ eta square is 0.30
7. „Is able to slide on back“ eta square is 0.57
8. „Is able to to jump into shallow water“ eta square 0.18
9. „Is able to jump into deep water“ eta square is 0.46
10. And last one, estimating of swimming efficiency of initial and final state is rated from 1 to 5, for which eta square is 0.85

Based on the data shown on chart we can see that 20% students got grade 1, 4.08% got grade 2, 8.17% got grade 3, 6.94% got grade 4, 10.63% got grade 5 and 70.61% got grade 5, table no.3 and chart no.1

Table 1. Elementary swimming school program - non-swimmers

| Content of the day (24 hours) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--|---|---|---|---|---|---|---|---|---|----|----|----|
| Checking the initial state | + | | | | | | | | | | | |
| Games and exercise exercises on water | + | + | | | | | | | | | | |
| Breathing exercises and exercises | + | + | + | + | + | + | + | + | + | + | + | |
| Games and exercises to break and watch | | + | + | | | | | | | | | |
| Floatage | | | | + | + | + | | | | | | |
| Water slide | | | | | + | + | + | + | + | + | + | |
| Jump elements (head to toe) | | | | + | + | + | + | + | | | | |
| Hand-tie technique, arms, legs, coordination | | | | + | + | + | + | + | + | + | + | |
| Back technique - legs, hands, coordination | | | | + | + | + | | + | + | + | + | |
| Checking the transit state | | + | | + | + | + | | + | + | + | + | |
| Check final | | | | | | | | | | | | + |

Table 2. Results of the T-test of the knowledge of swimwear and swimming efficiency criteria of the initial and final state

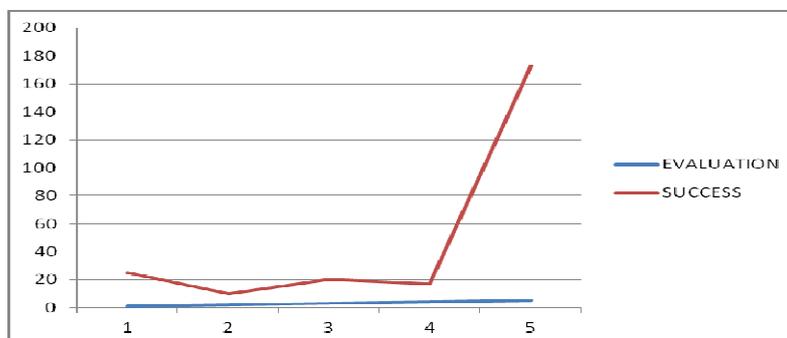
Paired Samples Test

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---------|---------------|--------------------|----------------|-----------------|---|---------|---------|-----|-----------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | SUV - SUV1 | ,061 | ,551 | ,035 | -,008 | ,130 | 1,739 | 244 | ,083 |
| Pair 2 | SPG - SPG1 | ,102 | ,615 | ,039 | ,024 | ,179 | 2,595 | 244 | ,010 |
| Pair 3 | SČV - SČV1 | ,224 | ,648 | ,041 | ,142 | ,306 | 5,417 | 244 | ,000 |
| Pair 4 | DUV - DUV1 | ,530 | ,539 | ,034 | ,462 | ,598 | 15,394 | 244 | ,000 |
| Pair 5 | PNP - PNP1 | ,326 | ,620 | ,039 | ,248 | ,404 | 8,240 | 244 | ,000 |
| Pair 6 | PNL - PNL1 | ,591 | ,532 | ,034 | ,524 | ,658 | 17,397 | 244 | ,000 |
| Pair 7 | KNP - KNP1 | ,428 | ,640 | ,040 | ,348 | ,509 | 10,479 | 244 | ,000 |
| Pair 8 | KNL - KNL1 | ,571 | ,495 | ,031 | ,509 | ,633 | 18,037 | 244 | ,000 |
| Pair 9 | SNP - SNP1 | ,285 | ,607 | ,038 | ,209 | ,362 | 7,364 | 244 | ,000 |
| Pair 10 | SND - SND1 | ,469 | ,500 | ,031 | ,406 | ,532 | 14,692 | 244 | ,000 |
| Pair 11 | INC_M - FIN_M | -28,469 | 11,780 | ,752 | -29,951 | -26,986 | -37,827 | 244 | ,000 |

Table 3. Ratings and progress

| EVALUATION | 1 | 2 | 3 | 4 | 5 |
|------------|--------|-------|-------|-------|--------|
| SUCCESS | 25 | 10 | 20 | 17 | 173 |
| % | 10,20% | 4,08% | 8,17% | 6,94% | 70,61% |

Chart 1.



DISCUSSION

Since on variable „Is able to go in water“, there was no change, because all of apprentices were willing to go in water in initial and final evaluations, we

concluded that this test is too easy and shouldn't be used in future tests. Progress under influence of programme which was used we can see on variables „how many meters did student swam“, „slides on

back“, „floats on back“, „breathing underwater“ and „jump into deep water“. This research showed us that biggest progress was under „floating on back“ and „sliding on back“ variables, mostly because apprentices relaxed and breathing didn't make big problem. When we look generally on breathing, we can see that exercises and games got a lot of attention. Following progress made, generally on all variables together, „how many meters did student swam“ variable had biggest progress, but this progress wouldn't be possible if previous variables wasn't successful.

Variables „floating on back“ and „sliding on back“ got moderate success, which is understandable because it's heavily dependant on breathing underwater. Actually, students had to overcome problem of breathing, so they can do sliding and floating successfully. Variables „jump into shallow water“, „squat in water“ and „getting head wet“ didn't had as much as success like ones we mentioned before. In initial and final state, students were not afraid to do those tests, so that explains why difference isn't that big. Even in final grading, these tests weren't hard and students don't give much attention to it. Regardless to that, test results were needed to be saved for future informations or comparisons. Since all students weren't swimmers when they started (their grade was 1), and in final state, 80% got 5, which means there became swimmers, so test was successful. In previous tests (J.A.D. Kinnear and J.S. Sawbridge, 1982), final results showed that 12 hours of training weren't enough, yet good trainer can make good results in that time period. Torlaković (2009) in his research concluded that children with previous experiences in any kind of sports, learned to swim easier than those who didn't had any activities. In this research, most of the students didn't had any activities so results were little bit lower than expected. While teaching younglings, progress and success can be accomplished much easier through games. It is needed to take care and have enough

time to track progress (mostly dynamic and motoric skills) of every individual in group as often as possible. Trainers didn't divide students in groups at very beginning, but they tracked every individual then formed certain groups for which they thought they will be successful. This programme is advised to every organisation and individual whose goal is to learn people to swim. Bigger fond of hours is suggested to every primary/elementary swimming school, 24 hours is optimal, while containing many water games for kids. If there are multiple groups in one group, and if every group is ranked by its grade, success chance is bigger. This way, students can easily swap groups, and it gives them more pride and motivation if they are moving to better and better group in short amount of time. By going into better ranked group, it's assumed that they are willing to progress even further and go into more better group. Programme had positive effects on students and it's confirmed by final evaluations.

CONCLUSION

In this research, results are proving that there were significant breakthroughs. Also we can conclude that students were psychologically adapted to water environments during classes, and that makes big and important role in process of learning basic elements of swimming. As expected, swimming dynamics followed with better results (regardless of technique used) as we can see in charts represented earlier. This way, respondents switched to better ranked groups earlier. Only by going into better group, students had more motivation to progress even further and move into more better group than one they were in before, which means they progress fast. If there were multiple group in one group, ranked by grades, students would get better knowledge. This 24-hour programme is suggested to all organisations and individuals who are into primary/elementary school of swimming.

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EFFECTS OF SPORT TEACHING ON TRANSFORMATION OF MOTORIC ABILITIES OF STUDENTS OF FACULTY OF EDUCATION IN MOSTAR

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Abstract

The main goal of the research was to define statistically relevant differences of arithmetic means of motoric abilities at examinees in two time periods. Sample of examinees was constituted of 35 students from Department of Sport and Health at Faculty of education at University „Džemal Bijedić“ of Mostar. Kinesiological operator in this research is represented by quarterly program of teaching Sport performed in accordance to plan and program of Faculty of education, Department for Sport and Health. In the sample mentioned above 12 tests were applied for evaluation of: balance, coordination, speed, flexibility, explosive strength, static strength and repetitive strength. Analysis of differences of arithmetic means was done by T-test of small dependable samples. Results have shown that quarterly program of teaching Sport and health has produced positive transformations of basic-motoric abilities of students at most of the variables.

Keywords: sport and health, football, basketball, athletics, volleyball, anthropomotorics.

INTRODUCTION

Motoric abilities define potential of a human in performance of motoric manifestations, simple or complex movement (Sekulić and Metikoš, 2007). They are defined as a complex of individual physical and psychological characteristics which are possible to develop with a limiting factor of biological predisposition (Dautbašić i Bradić, 2005). For healthy grow and development of children it is especially important timely and optimal level of development of motoric abilities (Findak, 2001). For their development, continuous and systematic body workout is needed which the young cannot fulfil with two hours of Sport in school. In the research the main assumption was that the regular class of Sport and Health, defined by 14 teaching classes (7 subjects x 2 teaching classes) in a week, will induce statistically significant changes in the area of motoric abilities of students of Department of Sport and Health.

Regular classes of Sport at the Faculty of education are conducted as obligatory for all students of the Department of Sport and Health. Many researches have shown that student population spends its free time in percentage of only 20% in certain activities. Slater, M. (2005), in his research, has concluded that it is necessary to pay more attention to theoretical lectures from the area of sport than it is usual and in accordance to that enhance opinion about physical activity. Balboa, J. M, Barret, K., Solomon, M., Silverman, S. (1996) under the content of physical education (sport or physical culture) imply teaching about movement in three different ways: teaching in movement, teaching about movement and teaching through movement. Learning with understanding, implementation of knowledge, recognising changes and constant evaluation and familiarising with new information are, according to the opinion of these authors, key factors which benefit to development of cognitive processes. Students are the last population that can be influenced according to plan

and systematically when it comes to education about sport, and all that with a purpose of indicating to lawfulness, principals of exercising and developing a habit of regular physical activity as well as its benefits on young people. Next to realization of programs in regular class, a great deal of attention is dedicated to informing students of specificities of anthropological status of people of their age.

METHOD OF WORK

Sample of examinees is made of 35 students of male gender, aged between 19 and 22 years, studying Sport and Health at the Faculty of education at University „Džemal Bijedić“ of Mostar. Middle age value is 20.1., while the average aberration of all results from the arithmetic mean is 1.19.

Sample of variables

During process of test selection, the accent was on metric characteristics. Measuring instruments for this research encompassed the area of basic-motoric abilities, 12 tests. All tests have been taken from the book *Testing and measuring in sport* (Mikić, 1999) and *Methodology of scientific-research work in kinesiology* (Čolakhodžić and Rađo, 2011).

Tests for balance assessment

1. Standing with two legs longitudinally on a bench with closed eyes (MBAU2Z)
2. Standing with two legs longitudinally on a bench with opened eyes (MBAU2O)

Tests for assessment of frequency of movement (segmentary speed)

3. Taping with hand (MFTAP)
4. Taping with leg (MBFTAN)

Tests for assessment of flexibility

5. Flexibility with bat (MFLISK)
 6. Touch-toe with legs in a gap (MFLPRR)
- Tests for assessment of explosive strength
7. Long jump from a place (MFESDM)

8. Pole vault from a place (MFESVM)

Tests for assessment of repetitive strength

9. Pull ups on a horizontal bar with a grip (MRAZGN)
10. Squat with weight (MRLPCT)

Tests for assessment of isometric (static) strength

11. Endurance in a pull up (MSAVIS)
12. Endurance of weight in a squat (MSLIZP)

Plan and program of work

Classes of the Department for Sport and Health were held in the summer semester. A group of 35 students were included in the program. According to plan and program of the summer semester, classes were organized from subjects: Volleyball, Athletics, Anthropometrics, Football, Water sports, Acrobatics and Gymnastics. Classes from the mentioned subjects were held twice a week in duration of one school class. Hence, the program lasted three months.

Methods of data analysis

Analysis of data was performed in program package SPSS 19. Primarily, analyses of central, dispersional parameters were made and normality of result distribution was tested. For analysis of differences of arithmetic means of motoric abilities of students between two time periods, after implemented kinological operators, T-test of small dependable samples was used.

RESULTS AND DISCUSSION

By analysis of differences of arithmetic means (table 1) of the variables for assessment of motoric abilities of the observed group, according to the value of standard error of arithmetic means and T-test, it can be seen that in 7 out of 10 variables there is a statistically significant difference, except in variables for assessment of movement frequency speed (MBFTAR, MBFTAN), flexibility (MFLISK, MFLPRR), explosive strength (MSAVIS and MSLIZP). Variables in which statistically relevant effect of conducted plan and program was gained are variables for assessment of explosive strength (MFESVM), for assessment of repetitive strength (MRLPCT and MRAZGN), for assessment of static strength (MSAVIS and MSLIZP) as well as variables for assessment of body balance (MBAUZZ and MBAU2O). Having an insight into the colon which describes differences of arithmetic means between two measured time periods, we can conclude that significance of all variables is in benefit of the final measurement. As a subsystem of the entire structure of anthropological status of a human, motoric abilities are expressed to the utmost if followed with an

adequate level of motoric knowledge and vice versa. With activity of dosed treatment both systems can be developed simultaneously. It can be also assumed that one of the factors playing significant role in performance of motoric abilities is factor of motoric characteristics whose influence on motoric performance would be desirable to test together with this space. Breslauer, N., Marković, K. (2011) have similar results in their research which had a goal to examine the influence of one year program of teaching athletics on the area of motoric abilities. They have concluded that the teaching of athletics has positively affected all motoric abilities which were taken in consideration. Contrary to those facts, Svilar, L., Dadić, M. (2011) in their research, which had a goal to examine correlation of content of subcutaneous fatty tissue with tests used for evaluation of agility, come to a conclusion that content of subcutaneous fatty tissue doesn't necessarily have to be a factor which determines success in tests of agility of more complex structures of movement. Coordination skills (coordination of arms, legs and body, speed of learning new motoric tasks, factor of reorganization of the stereotype of movement, speed coordination, coordination in a rhythm, agility) are highly genetical (80%) and can be changed in a small measure through different operators and content, mostly in the period of childhood, that is, they can be developed more weakly than other motoric abilities.

In this research conducted in 2006. Ohnjec, K., Vuleta, D. and Gruić, I. had a goal to test influence of specially programmed six months training process on changes in some indicators of basic and specific motoric abilities of handball players, young cadets, of RK „Sloga” Sveta Nedjelja. Above mentioned authors concluded that implemented teaching training program causes similar effects as in our research. Furthermore, in research conducted by Torlaković, A., Rađo, I., Dautbašić, S. and Gec, M. (2010) the goal was to research existence and size of effects of practising different activities (swimming, aerobics and aqua aerobics) on motoric abilities, morphological characteristics and frequency of breathing and blood pressure. In the research of mentioned authors similar results were acquired. In fact, in most of the tested variables in a short period of time positive effects were acquired.

When we analyse results of the observed group and compare them to results of a paper done a long ago, with similar goal of research, we can conclude that Arunović (1978) came to similar results on a similar sample. He determined that program of Sport and Health education positively influences on changes of explosive strength and sprinter speed.

Table 1. Testing of the differences of arithmetic means of variables for assessment of motoric abilities

| Variables | | A. S. | S. D. | t | df | Sig. |
|-----------|--------|-------|----------|--------|----|-------------|
| Pair 1 | MBFTAP | .62 | 7.882 | .472 | 34 | .640 |
| Pair 2 | MBFTAN | .74 | 3.567 | 1.232 | 34 | .226 |
| Pair 3 | MFLISK | 3.40 | 15.65473 | 1.285 | 34 | .208 |
| Pair 4 | MFLPRR | 1.94 | 12.32869 | .932 | 34 | .358 |
| Pair 5 | MFESDM | 1.85 | 14.68321 | .748 | 34 | .459 |
| Pair 6 | MFESVM | -2.37 | 5.73475 | -2.446 | 34 | .020 |
| Pair 7 | MRAZGN | -1.37 | 2.647 | -3.066 | 34 | .004 |
| Pair 8 | MRLPCT | -4.40 | 6.255 | -4.161 | 34 | .000 |
| Pair 9 | MSAVIS | -4.47 | 12.24206 | -2.164 | 34 | .038 |
| Pair 10 | MSLIZP | -8.32 | 14.20368 | -3.469 | 34 | .001 |
| Pair 11 | MBAUZZ | -1.73 | 1.84259 | -5.578 | 34 | .000 |
| Pair 12 | MBAU20 | -1.78 | 3.85559 | -2.736 | 34 | .010 |

CONCLUSION

Results obtained by appliance of T-test point out that Sport and Health education caused statistically relevant changes of basic-motoric abilities. Regular Sport and health education produced a positive effect in 60% of the variables. Classes of Sport were based on content from these subjects: Volleyball, Athletics, Anthropomotorics, Football, Sports on water, Acrobatics and Gymnastics. Paper gives an insight into effects caused by sports teaching and in

such a manner that content of class can be further shaped to give wanted effects. As a concluding thought of this paper we are mentioning research by Bycur, D. et al. which had a goal to examine participation of youth in physical activities. They came to a conclusion that more physical activities need to be implemented at this age, because this is the age which is „critical“ when physical activity comes to mind and this is the age which prefers sedentary way of life.

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