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The effects of different motor abilities, on swimming speed whilst using the water polo crawl technique at 25 meters without the ball

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Abstract
The aim of this research is to establish the impact on swimming speed, whilst using different motor abilities doing the water polo crawl technique, up to 25 meters without the ball. Thus as demonstrated by a group of water polo players, aged 13-15 years.
For the analysis in the area where motor skills are applied, there are twelve predictor variables, including: a mechanism for structuring the movement method of synergistic regulation and control of tone, also the mechanism of regulation of excitation intensity and excitation mechanism, regulating the duration of the criterion variable speed whilst swimming the water polo crawl technique at 25 meters. Results of regression analysis showed the impact and use of motor skills in swimming speed, doing the water polo crawl technique at 25 meters.
These results may contribute to better programming hereafter and plans to work with younger age categories

Key words: **Cadets, competition, performance athletes**

Introduction

Water polo as a team sport represents a structure and a complex athletic activity and ability, therefore the level of motor skills in athletes must be at a very high level. Including the fundamental abilities of strength, speed and endurance, (Garbolewski and Starosta, 2013). Water polo as a team sport, participates of two teams of seven, one of whom is a goalkeeper. It's the very evolution of the game and rules that require you to have a better motor ability, therefore games become faster and more intense. An analyses of the men's team play and results show, that the transfer of the ball is very fast, and that the duration of a single attack in the game of water polo is (17.4 +1.2 seconds (Smith, 1998). One of the most essential skills needed are co-ordination, which plays an important role in improving the execution of all technical and tactical elements of the game (Modric et al., 2011). Therefore a need for more intensive research in co-ordination is needed in a game of water polo.

Similar research in the area of motor skills in a of game water polo investigated (Dopsaj et al. 2007; Kondrič et al., 2012; Stirn, 2010; Donev et al., 2009; Bampouras and Marrin, 2009). The research, conducted Polglaze et al. (2008) on the complexity of the water polo game for men, indicating high intensity and recurring technical elements of players, due to the specifics of where the activities take place (aquatic environment) as well as fights with opposing players.

Aleksandrović et al. (2011) they found that the functional capabilities play a great importance in all the elements of a water polo game. Escalante et al. (2011) leading to results that changed the rules of water polo games, that took place in the period of 2005th-2009th, requiring a softer game, (sharper criteria trials) and therefore today playing more water polo and swimming faster than earlier. Thus this sets higher requirements, in motor and functional capacities.

Therefore, the main objective of this research is to determine the impact of using various motor abilities on swimming speed whilst doing the water polo crawl technique at 25 meters without the ball.

Methods

Subjects

The example consists of 70 water polo players all male, aged 13-15 years. From the following water polo clubs; Sarajevo Canton: Academy Water Polo Club, Water Polo Club Torpedo, Sarajevo Youth Water Polo Club and Water Polo Club Beaver.

Sample of variables

The example predictor variables from space-basic motor abilities, water polo was performed using tests to Kurelić et al, (1975) and tests Eurofit (1988) as follows:

a) The mechanism for structuring movement that represents the co-ordination and movement functions,
   - Fluency in the air (OKZ)
   - Hand tapping (TAPR)
   - Foot tapping (TAPN)

b) The mechanism of synergistic regulation and control of tone, representing motor skills flexibility and balance,
   - Deep forward bend on the bench (DPK)
   - Retrieval whilst seated (SJED)
   - Transverse standing on a low balanced beam (GRED)

c) The mechanism of regulation of excitation intensity, which represents the ability of motor speed and explosive strength,
   - Run 20m from a standing start (20M)
   - Triple jump from your place (TRS)
   - Standing long jump (SDALJ)

d) Mechanism of regulation of excitation duration, which represents motor ability repetitive power and static power.
   - Duration of flight mid-air (VZG)
   - Raising your middle area up for 30 seconds (DT30)
   - Push-ups on parallel bars (SKL)

Speed swimming whilst using the water polo crawl technique without the ball, at 25 meters, is defined as the criterion variable. The water polo crawl technique is the basic movement of players in the water during the game. Also similar to front crawl swimming, however the difference being, is your body position in water. As well as to swimming freestyle, where the head is out of the water, which allows players to view the game and have good ball control.

Procedure

The research was conducted during regular training, in the same conditions that are necessary for testing with the same curriculum. The testing of motor skills and speed of swimming at 25 meters was carried out in the Olympic swimming pool Otoka, Sarajevo. The testing procedure of swimming at speed, at 25 meters, was carried out in such a way that the respondents started operating out of the water. And the character shown when the starter, starts the swimming competition. ("in their place", and then the whistle sounds). The timekeeper has a stopwatch to start and stop timing when the respondent hand touches the wall of the pool at the 25-meter. Each participant had two attempts, where there were better results as inscribed in the list of results. Results are measured in tenths of a second.

Methods of data processing

To determine the impact of different motor abilities when swimming 25m using the water polo crawl technique, without the ball, applied regression analysis using the statistical package SPSS 22.0 IBM.

Results

Observation values calculated parameters that are obviously multiple connections between motor abilities. And a predictor of swimming in water polo at the 25 meters, freestyle as criterion variables, (Table 1 and Table 2). This association of predictors with criteria variable is 87% (R = .864) and a statistically significant level of .000 (sig. = .000), which explains the overall variability of the criterion of 75%. The analysis of the impact of individual mobility variables (Table 3), it can be seen that the largest and significant impact on the criterion variable with the following variables: Fluency in the air (OKZ), deep forward bend on the bench (DPK), Retrieval whilst seated (SJED), Triple Jump from your place (TRS), Standing long jump (SDALJ), Duration of flight mid-air (VZG), Raising your middle area up for 30 seconds (DT30) and Push-ups on parallel bars (SKL). The significance of impact on swimming at 25 meters freestyle with mobility variables, in it condenses ability co-ordination, flexibility, explosive and static strength.

Table 1.Regression analysis of predictor set of motor skills

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,864	,746	,684	1,328

Table 2.Analysis of variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	253,792	12	21,149	11,991	,000
	Residual	86,422	49	1,764		
	Total	340,214	61			

Table 3. The Individual predictors and impact on the criterion variable speeds whilst using the water polo crawl technique, at 25 meters without the ball.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	OKZ	,790	,207	,387	3,821	,000
	TAPR	-,112	,062	-,214	-1,809	,077
	TAPN	,129	,111	,143	1,160	,252
	DPK	,089	,041	,222	2,190	,033
	SJED	-,064	,025	-,302	-2,545	,014
	GRED	,081	,060	,132	1,338	,187
	M20M	-,011	,543	-,002	-,021	,983
	TRS	,015	,004	,421	4,230	,000
	SDALJ	-,041	,011	-,472	-3,855	,000
	VZG	-,101	,026	-,636	-3,841	,000
	DT30	,182	,062	,257	2,946	,005
	SKL	,292	,133	,369	2,192	,033

Discussion

The aim of this study is the identification of different motor abilities on swimming speed, whilst using the water polo crawl technique, at 25 meters without the ball. And the obtained results confirm the achievement of the defined objectives of research.

Similar studies were conducted by Meckel et al. (2013) who investigated by repeating the sprinting ability between water polo players and swimmers at 25 and 800 meters. The results showed that elite water polo players have less aerobic and anaerobic capacity in relation to elite swimmers. We believe that the reason for these results is that water polo players in the structure of the game are disturbing factors which are opposing players and contact with them and pass.

Uljević, Spasic and Sekulic (2013) have explored various motor fitness tests and their reliability and factorial and discriminative validity in water polo players aged 15-17 years old in terms of their position in the game. The results showed that one of three separate motor variables, swimming sprint capacity. The most likely reason is that young water polo player's posse the starting acceleration and maximum speed of swimming ability to come to the ball or by being the last player in the game.

Stirn (2010) evaluated specific motor characteristics of young water polo players and put them into three different groups. This was completed by a sample of 264 players, and came to the result that swimming 25 meters without the ball, better discriminates against competitors between 12 and 14 years. Indicating that the criterion variable in this study, swimming at 25 meters without the ball has its foundation in the testing of young water polo players, and that has its exemplary procedures in further research. In our opinion, that with the older age water polo players, it is necessary to use the ball at 25 meters during training, which will increase the performances of young water polo players.

Cockle (1998) tested 325 water polo players, aged 8-15 years researching the impact of motor skills on the results of swimming the water polo technique, at 25metres without the ball. He came to the conclusion that the success rate of swimming using the water polo crawl technique without the ball, at 25 meters does not co-ordinate the entire body while using freestyle techniques. We believe that the reason for performing techniques like the water polo crawl, without the ball, making it a very complex movement, which involves a complete range of body work from legs, arms and breathing. And what it failed to unify, is that such a movement requires, good co-ordination and body positioning and also this practice improves your abilities when making water polo thefts, at 25 meters without the ball.

Swimming using the water Polo crawl technique without the ball, is therefore much easier than swimming with the ball (dribbling), as Hayley et al. (2010.) in their research and stressed - Swimming with the ball reduces the speed of swimming in the men's water polo. Garrido et al. (2010.) had proposed so-called simple, dry technical forces, which are significantly associated with sprint swimming in younger water polo players.

Therefore, water polo players who have a higher level of basic motor skills applied - explosive and static strength, agility, speed endurance in swimming the water polo crawl, and have the flexibility of the whole body - were more likely to achieve better results in the test, speed of swimming whilst using the water polo crawl technique, at 25 meters without the ball.

Conclusion

The results of this study can provide coaches and players with valuable information about the importance of planning and development programming in exercise capacity at the cadet age and the need to constantly monitor the performances of water polo players, in the swimming pool. And the different stages of water polo games and segments of the energy capacity. Also, it opens up the need to repeat the same testing procedures with the use of water polo balls, because water polo is played at any given moment, only one player has a ball from the other five players are moving in the water without the ball.

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