

## ORIGINAL SCIENTIFIC PAPER

# Monitoring of Some Strength Parameters in Handball

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## Abstract

Handball is a sport, which requires high physical preparation as well as technical and tactical skills. Being tough sport scrolled with multiple players, it has huge power requirements, as well as a certain level of intelligence for solving of complex situations in the game. The aim of this research was monitoring of some strength parameters. The sample of subjects consists of 14 handball players, members of Handball Club Prishtina. Subjects were female, aged 20±2 years old. The measurements were made during the training sessions, in the sports gym where they train, during the 2008/09 season, initial measurement was made in the first micro cycle of preparatory period, while the final measurement was done after the end of the championship. Paired T-test were calculated for in initial and final measurement. The majority of variables have no statistically significant differences, and this should have come as a result of inadequate dosage of training loads and lack of proper training program.

**Key words:** Handball players, female, strength, competition

## Introduction

All Strength and conditioning experts around the world agree that, for time spent in the gym to have a positive impact on your sports performance, you must ensure the exercises you perform – and the way you perform them – are related to your sporting movements in competition (Jonathan, 2009). Morphological characteristics of the body and motor abilities certainly have a great influence on an outstanding performance in handball (Šibila, Mohrič, Pori, 2009). Modern handball team consists of intense and intermittent activities such as running, sprinting, jumping as well as fights between players (i.e. holding, pushing etc.) (Kvorning, 2006). Strength is one of the main skills in physical abilities (Bompa & Karrera, 2005). One of the current tendencies is to introduce in the structure of the power training sessions specific “kinetic muscle chains” training elements, meant to improve the specific strength and power indices of the handball players (Acsinte, Alexandru, & Milon, 2009).

Assessment of power and strength could be multidimensional. Strength, while having potentially multiple definitions, is probably best defined as “the maximum amount of force of

a muscle or a group of muscles that can generate in a specific movement pattern at a specific velocity of movement (Knuttgen & Kraemer, 1987; as cited in Reiman & Manske, 2009). Handball consists of intensive game, swift (sprint), jump, decline, and “battles” within official rules of the game, and where permitted, that are catching, drawing, pushing and holding the opponent player. All these elements make the Handball very tough sport. The match shows who is stronger, faster, more stable, more powerful. So handball game requires players with high anthropometric parameters and with good motor skills like strength, speed, coordination etc. Having in mind all these qualities that characterize the game of handball, the most important and sensitive element is programming the loads of exercise. In a sample of a research that is conducted with top handball woman players, indicates the great potential of development of motor skills during the preparatory period (Srhoj & Rogulj, 2001). All this requires systematic and persistent work in selection and development of young handball players.

The purpose of this paper is monitoring of some strength parameters of handball during a competitive season in Women Handball Super League of Kosovo, by examining the impact of



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competitive strength in the outcome of competition, the objectives of the club were achieved by winning the National Championship, but real impact was shown on international level of competition. The Team that dominated against local teams, even up to 22 goals lead, failed to succeed in the qualifying competitions for the “Winners’ Cup. Pristina team held only five minutes the pressure of stronger team from Holland, while the difference at the end of two matches reaches - 47 goals.

**Methods**

The sample of subject consists of 14 handball players, members of Handball Club Prishtina. Subjects were female, aged 20±2 years old. The measurements were made during the training sessions, in the sports gym where they train, during 2008/09 championship. The championship consists of two seasons, autumn season (September-November) and spring season (March-May). Initial measurement was made in the first micro cycle of preparatory period of spring season, while the final measurement was done after the end of the championship. The preparatory period consisted of 20 training sessions while a week consisted of 5 training sessions with 90 minutes for each session. Within spring season there were played 13 matches which included the total number of 65 trainings.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS version 21.0). T-test were calcu-

lated for same groups in initial and final measurement.

**Sample of variables**

- Throwing the medicine ball from standing position (MHTOPM)
- Long Throwing the ball after triple steps (MHT3HL)
- Bench press-20 kg (MB20KG)
- Heart rate before the jump (PULQET)
- High jump after three steps with the ball in hand 5x5 jump (MK3HTO)
- Heart rate after jump (PULNGA)

**Results**

In Table 1 are shown results of descriptive statistics, mean and standard deviation of motor variables at initial and final measurement. Handball players have improved result (M=161.14, SD=29.99) in final measurement in comparison to the initial measurement (M=153.64, SD=34.62) in variable (MHTOPM) throw of medicine ball in distance, for around 8 metres. Second best improvement is achieved in hitting on the goal after three steps, with about 4 metres (initial measurement M=242.36, SD=60.66, final Measurement M=246.62, SD=55.5). In other motor variables differences between two measurements are very small. Differences between two measurements will be tested with paired sample T-test.

**Table 1.** Descriptive statistics for motor variables initial and final measurement

	Initial measurement				Final measurement		
	N	Mean	Std. Deviation		N	Mean	Std. Deviation
MHTOPMI	14	153.64	34.02	MHTOPMF	14	161.14	29.99
MHT3HLI	14	242.36	60.66	MHT3HLF	14	246.62	55.5
MB20KGI	14	24.5	12.02	MB20KGF	14	25.24	10.77
PULQETI	14	78.71	6.28	PULQETF	14	80.9	6.12
MK3HTOI	14	240.79	13.13	MK3HTOF	14	241.9	14.63
PULNGAI	14	164.57	20.9	PULNGAF	14	167.52	18.89

In Table 2 are shown the differences between the initial and final measurement. Initial measurement was made in the first micro cycle of preparatory period of spring season, while the final measurement was done after the end of the championship. According to the results (Table 2) there was found on-

ly one variable where are significant differences between two measurements p=.047. The majority of variables have no statistically significant differences, and this should have come as a result of inadequate dosage of training loads and lack of proper training program.

**Table 2.** Paired Simple T-test

		Mean	Std. Deviation	T	df	Sig. (2-tailed)
Pair 1	MHTOPMI-MHTOPMF	-.9071	1.6021	-2.119	13	.054
Pair 2	MHT3HLI-MHT3HLF	-.8143	1.6133	-1.888	13	.081
Pair 3	MB20KGI-MB20KGF	-2.7571	5.5438	-1.861	13	.086
Pair 4	PULQETI-PULQETF	2.1430	3.6550	2.193	13	.047
Pair 5	MK3HTOI-MK3HTOF	-7.3500	12.9065	-2.131	13	.053
Pair 6	PULNGAI-PULNGAF	-4.4290	16.9780	-.976	13	.347

**Discussion**

The aim of this research was monitoring of some strength parameters of woman handball players of Super League of Kosovo. According to the results there was no any improvement of force parameters in handball women players between initial and final measurement even some progressive transformation was expected. The amount of training in the preparato-

ry period, only 20 training, is not sufficient for achievement of workforce development at the desired level. Preparatory period with 41 trainings, can affect to achieve the force (Vuleta, Mila-novic, & Gruic, 2002). Also, the number of only five training sessions within a week was insufficient. Regarding mentioned training parameters the quality of teams in the Kosovo league is weak, as the club of this research has dominated all other

teams of Super League and easily won the National Championship, but has failed in international competitions.

Training loads by individual characteristics and specific skills in the game is a problem in itself that must have greater attention. Training loads should be done by adapting to the anthropometric status and motor abilities for each athlete individually.

There are many factors that could affect players' motivation as well as financial support plays important role in the level of responsibility, as well as coaching the game.

Therefore the recommendations are to increase the number of exercises in the preparatory period as well as in competition phase, training program should be based on anthropometric characteristics and motor abilities motivation will influence to increase responsibility and competition within the team.

We think that by taking account on mentioned factors would shorten the difference in quality in international competitions.

#### Acknowledgements

The researchers are grateful to Abedin Bahtiri from the Pristina University College for his contribution for organizing the measurements.

#### Conflict of Interest

The authors declare there are no conflict of interest.

**Received:** 17 March 2017 | **Accepted:** 25 April 2017

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