

Motor Profile of Croatian Women Senior Basketball Players by Positions in the Game

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Summary

The aim of this research was to determine the motor skills of Croatian women senior national team members who were preparing for the Olympic Games in London 2012. We will also compare the results with the playing positions of basketball players. Eleven (11) potential senior national team members participated in this study. A sample of variables was composed of tests to assess motor skills. Data processing was performed using the software package Statistical for Windows, ver. 12. For each variable, basic descriptive statistical parameters were calculated and presented. In almost all motor tests, defenders and wings show the best results, and the biggest differences between players in different playing positions are visible in tests of speed, agility, and explosive power.

Keywords: basketball; Motor skills; Women



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Introduction

In terms of its structure, basketball belongs to a group of more complex sports. The game itself requires an exchange of high and low intensity activities. Along with the basic technical and tactical knowledge, the players' success also depends on a high level of cognitive and conative personality traits as well as physical fitness and well-developed motor skills [1]. Motor skills enable fast, strong, precise, or coordinated performance of motor tasks [2]. In basketball, the most prevalent motor skills are coordination -various movement techniques performed by players with and without the ball; and agility-movement in defense, opening up for a pass, and changes of direction and pace of movement. Speed, especially reaction speed, balance, and strength, that manifests during specific shot movements, have a high impact on basketball performance. The aspect of precision in basketball includes two important segments, that is, passing precision and shooting precision. Of course, shooting precision greatly determines the success in the game, but nowadays the segment of a passing precision also has a high predictive value [1,3,4]. In the structure of a basketball game, speed is most often present as the speed of motor reaction. It is the ability of a player to quickly register all relevant information from the environment during a match and, based on that data, to create a response in the form of an adequate motor response. To observe the situation on the field, the position of the ball and the opposing players, and anticipate the possibility of further action - all this requires a high level of this ability [5]. Explosive power in jumping, speed and agility play an important role in the effective movement of players with or without the ball just as much as the basketball technique and tactic [6,7].

Methodology

The sample of examinees consisted of 11 senior women Croatian national team players preparing for the 2012 Olympic Games in London. The participants were informed in advance, both verbally and in writing, about the way in which each test was conducted and performed as well as their purpose. All participants completed the health questionnaire prior to performing the tests and agreed to the testing. According to the positions in the game, they are categorized as 1, 2 guards (n=5), 3,4 forwards (n=4), 5 centers (n=2). The sample of variables is composed of motor abilities based on valid metric characteristics [8-10] whereas the battery of tests is standardized by the Diagnostic Center of the Faculty of Kinesiology at the University of Zagreb. The 20-yard test (MAG20Y), the side-step test (MAGSSTEP) and the 4x5 meter test (MAG4x5M) were used to assess agility, while a 20-meter test was used to assess explosive strength in sprint performance. The explosive strength in vertical jumps was estimated based on test results from the countermovement jump test (MESCMJ), which was

applied by using the Kistler force platforms. Data processing was performed using the programming package Statistical for Windows, ver. 12. The following parameters were calculated for each variable: arithmetic mean (AS), standard deviation (SD), minimum value (MIN), and maximum value (MAX).

Results and Discussion

Basketball, in terms of motor skills, is dominated by agility (changes of direction of movement with the ball, movements in defensive stance etc.), explosive power of the upper and lower extremities (vertical jump, passes), balance, precision of passing and shooting, speed (starting speed and acceleration) etc., According to [11-17], agility is defined as the ability to slow down, accelerate and change the direction of movement while maintaining good body control. It is closely related to balance because it requires the player to continuously transfer the center of gravity of the body, due to the specific movements of the game itself, such as movement in the defensive stance or opening to receive the ball (Table 1-3).

Table 1: Descriptive statistical indicators of the results achieved in tests for the assessment of motor skills- guards. AM-Arithmetic Mean; SD-Standard Deviation; MIN- Minimum Value; MAX-Maximum Value; 20Y-The 20-Yard Test; 4x5ML-The 4x5 Meter Test with Ball; SSTEP-The Side-Step Test; 20m-20-Meter Sprint Test; CMJ- Countermovement Jump Test.

Var.	AM	SD	MIN	MAX
20Y	5.02	0.43	4.75	5.77
4x5ML	5.12	0.35	4.91	5.61
SSTEP	7.28	0.34	6.77	7.7
20m	3.73	0.08	3.6	3.81
CMJ	38.34	2.81	34.43	41.86

Table 2: Descriptive statistical indicators of the results achieved in tests for the assessment of motor skills - forwards. AM-Arithmetic Mean; SD-Standard Deviation; MIN-Minimum Value; MAX-Maximum Value; 20Y-The 20-Yard Test; 4x5ML-The 4x5 Meter Test with Ball; STEP-The Side-Step Test; 20m-20-Meter Sprint Test; CMJ- Countermovement Jump Test.

Var.	AM	SD	MIN	MAX
20Y	4.94	0.15	4.81	5.15
4x5M	5.17	0.35	4.77	5.63
SSTEP	7.27	0.39	6.72	7.59
20m	3.82	0.11	3.68	3.93
CMJ	37.63	0.96	36.36	38.7

Table 3: Descriptive statistical indicators of the results achieved in tests for the assessment of motor skills-centers. AM-Arithmetic Mean; SD-Standard Deviation; MIN-Minimum Value; MAX-Maximum Value; 20Y-The 20-Yard Test; 4x5ML-The 4x5 Meter Test with Ball; SSTEP-The Side-Step Test; 20m-20-Meter Sprint Test; CMJ-Countermovement Jump Test.

Var.	AM	SD	MIN	MAX
20Y	5.44	0.55	5.05	5.83
4x5ML	5.93	0.35	5.68	6.18
SSTEP	8.04	0.57	7.63	8.45
20m	4.13	0.32	3.9	4.36
CMJ	35.91	11.66	27.66	44.16

The results obtained by the test assessing the frontal-nimble agility (20Y) indicate variation in terms of players' position in the game. The players at the center position achieved the highest scores, which in this test means that they were actually the slowest, and their average result was $5,44 \pm 0,55$ sec. The players at the guard position achieved the average result of $5,2 \pm 0,43$ sec, whereas the fastest players in this test were those at the forward position with $4,94 \pm 0,15$ sec. In the side-step test (SSTEP) used for assessing the lateral agility, the most agile players were those at the forward position ($7,28 \pm 0,39$ sec), then the guards ($7,27 \pm 0,34$ sec) and then the centers ($8,04 \pm 0,57$ sec). On the basis of these results, it can be concluded that players at the forward position are more agile than those at the center, whereas there is little deviation in comparison to the guards. In the specific basketball 4x5-meter test we also notice a significant difference in terms of position between inner and outer circle players. The best scores were achieved, as expected, by players at the guard position ($5,12 \pm 0,35$ sec), followed by forwards ($5,17 \pm 0,35$ sec), whereas the lowest scores were achieved by players at the center position ($5,93 \pm 0,35$ sec).

Erčulj et al. [18] conducted a research on the Serbian and Slovenian senior selection in relation to the motor skills of the players at different positions in the game. In assessing the explosive strength in sprint performance, the 20-m sprint test was used and the results were as follows: guards $3,50 \pm 0,15$ sec, forwards $3,57 \pm 0,08$ and centers $3,7 \pm 0,85$ sec. Similar research was carried out by Delextrat and Cohen [19] on the English League II. division of players who achieved the following results: guards $3,37 \pm 0,17$ sec, forwards $3,53 \pm 0,22$ sec and centers $3,59 \pm 0,26$ sec. This comparison shows that Slovenian, Serbian and even English League II divisions were faster than our guards ($3,73 \pm 0,08$ sec), forwards ($3,82 \pm 0,11$ sec) and centers ($4,13 \pm 0,32$ sec). The successful performance of jumps in defense and attack, fast passes, and short sprints largely depend on the player's explosive strength. In a single basketball game, the player jumps 46 times on average, which underlines the importance of the vertical jump in basketball [20,21]. In this study, a test for measuring the vertical jump type

explosive power is used, Counter movement jump (CMJ), for evaluating the vertical jump type explosive power and it obtained the following average results: the guards achieved 38.34±2.81cm, the forwards, 37.63±0.96cm, and the centers, 35.91±11.66cm. It is surprising that the centers achieved the poorest result in this test, especially considering that they are expected to make the greatest number of jumps in a game.

Conclusion

Based on the obtained results in almost all motor tests, the best results were achieved by guards and then forwards. The biggest differences between players in terms of their position were noticed in tests for assessing speed, agility and explosive strength. Comparing the obtained results with those of other selections, namely Slovenian and Serbian, our players are slightly lagging behind. We have to take into account that, at the time, these were our best players preparing for the 2012 Olympic Games in London and they have achieved the historic success of Croatian female basketball, so the possible poor results could be due to the lack of motivation for the testing itself. However, these results can be useful in future, namely for comparison with upcoming generations.

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