

REACTION TIME AND COORDINATION FOR FEMALE BASKETBALL PLAYERS THROUGH THE USE OF MGM-15 JUMPING CARPET

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ABSTRACT. Introduction. Coordinative abilities (dexterity) rely on the movement control and regulation processes: they are of crucial importance in many sports, as they allow athletes to easily control their motor actions. **Objectives.** The aim of this paper was to determine if there is a correlation between the reaction time and the coordination coefficient for basketball players. **Materials and Methods.** The participants in this study were female basketball players (N = 9), aged from 16 to 17 years that underwent two measurements: the jumping reaction time test and the coordination coefficient test (EVC) using the MGM-15 carpet. **Results.** There was a positive correlation between the jumping reaction time and EVC, $r = 0.996$, $n = 9$, $p = 0.000$. **Conclusion.** The reaction time and the coordination coefficient showed a strong correlation.

Keywords: *basketball, reaction time, coordination, jumping*

REZUMAT. Timpul de reacție și coordonarea la jucătoarele de baschet folosind covorul pentru sărituri mgm-15. Introducere. Abilitățile coordinative (dexteritatea) se bazează pe control motor și procese regulatoare: ele sunt de importanță crucială în multe sporturi deoarece permit sportivilor să și controleze cu ușurință acțiunile motrice. **Obiective.** Scopul acestei lucrări este de a determina dacă este o corelație între timpul de reacție și coeficientul de coordonare la jucătorii de baschet. **Material și metode.** Participanții în acest studiu au fost jucătoare de baschet (N=9), cu vârsta de 16 și 17 ani. A fost măsurat timpul de reacție pentru săritură și coeficientul de coordonare (EVC) folosind covorul MGM-15. **Rezultate.** A fost o corelație pozitivă între timpul de reacție și EVC, $r=0.996$, $n=9$, $p=0.000$.

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Concluzii. Timpul de reacție și coeficientul de coordonare sunt corelate puternic.

Cuvinte cheie: *baschet, timp de reacție, coordonare, săritură*

Introduction

Quickness is the ability to perform a single (non repeated) movement in the shortest time and it is a crucial skill in sports. The analysis of contact times is an effective means to evaluate athletes' acyclic rapidity and it was recently used to quantify the performance of professional athletes during lateral plyometric exercises (Wong et.al., 2012).

Coordinative abilities (dexterity) rely on the movement control and regulation processes: they are of crucial importance in many sports, as they allow athletes to easily control their motor actions. Moreover, they permit to learn complex movements in a relatively rapid way (Atan and Akyol, 2014).

Reaction times depend on motor nerve conduction velocity and are commonly divided between auditory reaction times (ART) and visual reaction times (VRT). It has been demonstrated that ART are less important than VRT, since it is essentially a visual game (Spierer et. al., 2011; Ruschel et. al., 2011).

All athletes who are involved in team sports should have some advantages in their motor skills as well. These skills are to be improved by training. It is a fact that strength, agility, endurance, flexibility, and balance all of which are the factors used consecutively in aerobic and anaerobic systems which affect the performance of both team sports and individual sports (Tamer,2000). In order to be successful in sport events, an athlete must show a high performance with regard to physical and motor skills. One of the parameters that enables an athlete to have such performance is reaction time (Koç et. al., 2006). Reaction time is defined as the time that elapses between receiving an immediate and unexpected stimulus and reaction given to it, however, reaction time changes based upon factors such as age, gender, condition, fatigue, high altitude, alcohol, nicotine and use of psychotropic substances. (Colakoglu et. al., 1993). Hand-eye coordination plays an important role especially in individual sports that require high motor hand skills such as handball, volleyball, basketball and racket sports (Menevşe, 2011). Fox and his fellows stated that athletes with better performances also have better reaction time than the others.

Objectives

The aim of this paper was to determine if there is a correlation between the reaction time and the coordination coefficient for basketball players, measured using the MGM-15 jumping carpet.

Methods

Subjects

The participants in this study were female basketball players (N = 9), aged from 16 to 17 years that underwent two measurements: the jumping reaction time test and the coordination coefficient test (EVC) using the MGM-15 carpet.

Methods and the Steps of the Research

We used the MGM-15 Jumping Carpet for test. The test consists of 15 jumps repeated 3 times: once for the left leg, once for the right one and last time on both legs. The legs must not be bent during the execution of the jumps. The software from the MGM-15 Jumping Carpet offered out, among others, two measurements for each subject named: reaction time and EVC (energetic variance coefficient). The reaction time is measured in milliseconds, while the coefficient is just a quantifiable number. The test was repeated 3 times and the average value for the two variables was recorded.

Results

After the tests, the data collected was centralized in Table 1.

Table 1. Collected data for each subject regarding the average reaction time and average EVC

Subject	Reaction_Time	EVC
1	0.325	6
2	0.458	11
3	0.39	8
4	0.452	11
5	0.332	6
6	0.377	7
7	0.489	14
8	0.462	13
9	0.401	8

Table 2. Correlation between the reaction time and EVC

		Reaction_Time	EVC
Reaction_Time	Pearson Correlation	1	.966**
	Sig. (2-tailed)		.000
	N	9	9
EVC	Pearson Correlation	.966**	1
	Sig. (2-tailed)	.000	
	N	9	9

** . Correlation is significant at the 0.01 level (2-tailed).

A Pearson product-moment correlation coefficient was computed to assess the relationship between the jumping reaction time and EVC of female basketball players. There was a positive correlation between the two variables, $r = 0.996$, $n = 9$, $p = 0.000$. Overall, there was a strong, positive correlation between jumping reaction time and EVC. Increases in jumping reaction were correlated with increases in coordination coefficient.

Conclusion

Even though for both variables measured the values obtained by the athletes were under expectations considering their training and level of performance, the correlation of the two can't be questioned. The reaction time and the coordination coefficient showed a strong correlation. This implies that the jumping reaction time for basketball players is linked with their level of coordination.

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