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Performance comparison of the right and left basketball lay-up in hand and foot ipsilateral and contralateral conditions

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ABSTRACT

Numerous studies show that there is relationship between skilled performance and body organs dominants, such as hands, feet and eyes. In order to compare the performance of left and right basketball lay-up in ipsilateral and contralateral conditions of hands and feet in male students of Tabriz Islamic Azad University, 100 male student were selected by a described questionnaires, Chapman - Chapman hand superiority and Wai - Hong Jackie Lam foot superiority and were randomly divided into four groups:

1) 30 right ipsilateral, 2) 30 left ipsilateral, 3) 20 right contralateral and 4) 20 left contralateral. Participants tried left and right lay-up in 150 trials for 5 days and finally 10 efforts for an optimal test were conducted. Data was analyzed by variance of 2 × 4 combined design within and between groups, and Bonferroni test. By analyzing the proposed hypotheses at the P≤ 0.01 demonstrated significant differences among groups in performance. In general, contralateral students, especially right contralaterals had better performance compared with other groups.

Key words: lay- up, basketball, right ipsilateral, left ipsilateral, right contralateral, left contralateral.

INTRODUCTION

Human performance can be affected by several variables, recognizing of such variables will be promoting significantly human performance. Although some factors, such as body composition, strength, height, age and gender may have an impact on human performance [10]. Communication and complex coordination exists among different systems of the body. This coordination depends on important factors such as dominance of body organs, especially eye and

hand are more important [4]. Ipsilateral people are those whose dominant hand, leg and eye are located in the same side of the body and contralateral are those their dominant organs are located in complex or in a combination form on both sides of their bodies (2). In trying to explain why the lateral is more effective than contralateral, Grouios et al (2004) stated that people can more easily adapt their dominant eye, hand, ball and net in a straight line [4]. On the other hand, some scientists such as Coren (1993) concluded that contralateral people act much better than ipsilateral ones in basketball. Because contralateral people's center of mass is closer to the median line of the body , so much more balanced and thus have a more direct shot and not to have to compensate spin to superior side of the body [2]. Rezaiyan (2007) compared the accuracy of students eye and hand lateral and contralateral superiority in basketball free throw. Results demonstrated that left ipsilateral students perform better than right lateral and contralaterals [8]. Hatzinkolao[3] and colleagues (2001) studied the accuracy of basketball free shot in professional lateral and contralateral players. The results demonstrated contralateral players made much more errors than ipsilateral ones in free throw [8]. Jones and colleagues (1996) studied the relationship between eye preference and shooting practice in learning of soldiers shooting. As a result, learning relates to preferred eye, and ipsilateral soldiers learned shooting easier than contralateral soldiers [6]. Classe and colleagues (1996) studied relationship between eye and hand preference and hitting in south baseball league players, to examine accuracy of 215 professional baseball players. The results showed no significant relation between the superiority of eye, hand and accuracy of hitting in baseball players [3]. Sheeran (1985) studied the effect of ipsilateral and contralateral in shooting skill. The results supported superiority of lateral ones in shooting [9]. Carey and colleagues (2009) studied two feet dominants and results showed that more professionals use their nondominant feet more than amateurs [1]. Kalaycioglu et al (2008) studied the status of foot dominant, relationship between foot, hand superior and hand and foot hitting performance. The results showed that leg dominant in skilled and unskilled movements related to hands superiority and hand and foot hitting speed [7]. Takeda (2009) studied difference reactions between left and right hands during the rotation of hand mental images. The results showed that the right dominants are faster than left ones [8]. Grouios (2006) studied the Right hand advantage in visually guided reaching and aiming movements. The Overview concluded that the right people show the aiming tasks faster, more refined and with higher degree of spatial accuracy when performed with right hand [5]. Therefore, according to the superiority of ipsilateral and contralateral limbs as complementary physical factors in improving athletic performance, the different results obtained from various investigations in this field, in this study it has been trying to investigate the influence of hand and foot ipsilateral and contralateral in basketball lay-up boys students.

MATERIALS AND METHODS

One hundred university male students were selected randomly by a described questionnaires, Chapman - Chapman hand superiority and Wai - Hong Jackie Lam foot superiority and were randomly divided into four groups: 1) 30 right ipsilateral, 2) 30 left ipsilateral, 3) 20 right contralateral and 4) 20 left contralateral. Participants tried left and right lay-up in 150 trials for 5 days and finally 10 efforts for an optimal test were conducted. In order to collect the scores, Zachry method et al (2005) was used .Data was analyzed by variance of 2 × 4 combined design within and between groups, and Benferroni test.

Table 1. Within Groups

Effect	Sum of Squares	df	Mean Of Squares	F	Sig.
Performance	6.163	1	6.163	.728	.396*
Performance* Group	113.678	3	37.893	4.477	.005
Error	812.617	96	8.465		

As it is shown in Table 1, there is not significant difference between right and left basketball lay-up (.396 ≥ .05), but there is significant difference between performance and group (.005≤ .05).

Table 2. Between Groups

Effect	Sum of Squares	df	Mean Of Squares	F	Sig.
Within origin	36168.120	1	36168.120	3979.454	.000*
Group	180.578	3	60.193	6.623	.000*
Error	872.517	96	9.089		

As it is shown in Table 1, there is significant difference between groups (.000≤ .005).

Table 3. The results of Bonferroni test

Group 1	Group 2	Groups Means Differences	Std. Error	Sig.
Right Contralateral	Right ipsilateral	2.167*	.615	.004*
	Left ipsilateral	2.483*	.615	.001*
	Left Contralateral	1.05	.674	.736

According to pursuit Benferroni:

- Performance of right contralateral lay-up is more significant than right ipsilateral.
- Performance of right contralateral is more significant than left ipsilateral.

DISCUSSION

The results showed that performance of right contralateral lay-up group is more significant than other groups, that means this superiority of performance compared with right and left lateral group was significant and in other groups was low and meaningless. Shiek research (1974-1997) showed there was no difference in superiority of ipsilaterals compared with contralaterals in basketball free throw [8]. Coren (1993) found a superiority of contralaterals than laterals in basketball free throw. They described it as intransfer of center of mass to one side of the body and having a desired balance during shooting. Results of this study is inconsistent with Grouios and colleagues research (2004). They expressed lateral ones can c adapt their dominant eyes, hands, balls and net in a straight line and have less error. Hatzinkolao (2002) review carefully the professional ipsilateral and contralateral players in free throw and concluded that contralaterals have more errors [8]. However, despite contradictory findings about the effects of ipsilateral and

contralateral of hand and foot, much research is needed.

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