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RESEARCH ARTICLE

# Relationship between Core Strength and Explosive Power on University Male Handball Players

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## ABSTRACT

The purpose of the study is to examine the relationship between core strength and explosive power in terms of vertical and horizontal on university male handball players. Twenty (20) male handball players were selected from Department of Physical Education and Sports Science, Annamalai University. Explosive power in terms of vertical and horizontal was selected as criterion variable, which was measured by vertical jump and standing broad jump test. The core strength was measured by trunk flexion, trunk extension, right and left lateral trunk flexion test. The result of the study showed no significant relationship between core strength and explosive power in terms of vertical and horizontal. It is concluded that there was no significant relationships between core strength and explosive power on university male handball players.

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## INTRODUCTION

It is believed that a strong core allows an athlete the full transfer of forces generated with the lower extremities, through the torso, and to the upper extremities and sometimes an implement (Nesser & Lee, 2009). A weak core is believed to interrupt the transfer of energy, resulting in reduced sport performance and risk of injury to a weak or underdeveloped muscle group. For this reason, there is an assumption that an increase in core strength will result in increased sport performance. Therefore, training the core has become popular among strength coaches and personal trainers as a means to improve performance and reduce the chance for injury despite the lack of research to support such findings (Nesser & Lee, 2009).

To evaluate the role of the core musculature in sport performance, studies have examined correlations between various measures of the core and performance by athletes in cycling, American football, soccer, rowing and swimming (Abt, *et al.*, 2007; Nesser, *et al.*, 2008; Nesser & Lee, 2009; Tse, *et al.* 2005; Scibek, 1999). However, these studies provided mixed result on relationship between core strength and sports performance. This was the first attempt made by researcher to examine the relationship between core strength and explosive power in terms of vertical and horizontal on university male handball players.

## METHODS

### Subjects

Twenty (20) male handball players selected from the Department of Physical Education and Sports Sciences, Annamalai University. The mean  $\pm$  SD of age, height and weight were 21.15  $\pm$  2.23 years, 1.71  $\pm$  8.25 m, 61.40  $\pm$  8.55 Kg respectively. On average, the players had 5.9  $\pm$  2.1 years of playing experience and represented various format of competition.

### Variable and test

The explosive power in terms of vertical and horizontal was selected as criterion variable. Vertical jump test and standing broad jump test was administered. The core strength was measured by trunk flexion, trunk extension, right and left lateral trunk flexion test.

### Statistical analysis

The relationship between core strength and explosive power was established using person product movement correlation (r). The data was analysed with SPSS statistical package (16 version). The criterion for significance was set at an alpha level of  $p < 0.05$ .

## RESULTS

The mean and standard deviation of selected criterion variables are presented in Table 1. No significant correlations were identified between total core strength and explosive power in terms of vertical and horizontal are given in Table 2.

**Table 1** Mean and Standard deviation of criterion variables

Variables	Mean	Standard deviation
Trunk Flexion (Sec)	126	7.50
Trunk Extension (Sec)	184	4.50
Right lateral flexion (Sec)	144	5
Left lateral flexion (Sec)	149	4.40
Total core strength (Sec)	608	10.42
Explosive power in terms of vertical (cm)	44.30	6.84
Explosive power in terms of horizontal (cm)	210.21	12.92

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**Table 2** Correlation between total core strength and explosive power

Test	Total Core strength
Explosive power in terms of vertical (cm)	0.358 ± 0.10
Explosive power in terms of horizontal (cm)	0.241 ± 0.13

## DISCUSSION

The current study incorporated McGill's core stability tests. These tests were designed to measure muscle endurance of the core musculature. Muscles that can sustain prolonged contractions (i.e. muscle endurance) are less likely to fatigue and can thus continue to provide support to the torso over time, reducing the chance of injury or to maintain sport performance. Therefore, greater (i.e. longer) core muscle endurance should correspond with a greater capacity to do work. Since the core strength tests used in the study had reported reliability coefficients of  $\geq .97$ , we believe that McGill's assessment of core strength is accurate (McGill, Childs, Liebenson, 1999). Similar result obtained in American football (Nesser, *et al.*, 2008) and soccer (Nesser & Lee, 2009).

## CONCLUSION

The result of the study proved to show no relationship between core strength and explosive power in terms of vertical and horizontal. However, core strength should not be abandoned which may lead to injury possibly because of lack of strength.

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