

Evaluation of Hand Shape Index Among University Male Handball Players



Physical Education

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ABSTRACT

The purpose of the study is to evaluate the hand shape index among university male handball players. One hundred and forty four (144) male handball players, selected from south west zone inter university handball tournament for the year 2010- 2011, organized by S.R.T.M. University, Nanded, Maharashtra. In this study data was collected from teams who reached quarterfinals and Annamalai university team. These selected subjects, who practice handball regularly and take part in competition and their age range between 18 to 28 years. The criterion variables selected in the present study was hand shape index. The result of the study showed that right ($F = 2.966, p = 0.004$) and left ($F = 2.966, p = 0.004$) hand shape index differ significantly among handball players. It is concluded that in right hand shape index LNUPE players and in left RU handball players had better hand shape index when compared to other team players.

Introduction

Handball is one of the Olympic Games team sports. It requires a high standard of physical endurance in order to compete 60 minutes of highly competitive play and to excel the performance. In handball, movement patterns are characterized as intermittent and change continuously in response to different playing situations. Anthropometric and morphological characteristics can obviously influence the effectiveness of such responses (Srhoj et al., 2002; Skoufas et al., 2003; Hasan et al., 2007; Zaportidis et al., 2009).

In handball handgrip strength is important for catching and throwing the ball in different team sports. Also, when the fingers are longer and hand surface variables greater than required for grasping an object (ball), fingers will less widely spread, and grasping an object will become more efficient and less fatiguing (Nag, Nag and Desai, 2003). According to research, handgrip strength has a positive relationship with body height, body weight, body mass index, hand length, body surface area, arm and calf circumferences, skin folds, fat free mass, physical activity, hip waist ratio, etc. But, to our knowledge, hand anthropometric characteristics have not yet been investigated adequately. Handgrip strength has been investigated frequently. Some researchers have investigated handgrip strength in children and adolescents (Gandhi et al., 2010), while other studies have considered differences between the dominant and non-dominant hand. In the present study shape index (Clerke et al. 2005) of the hand was assessed. Hand shape has been defined in various ways, but often as simply as the hand width to hand length ratio (W/L ratio). The purpose of the study is to evaluate the hand shape index among university male handball players.

Methods

Subjects

One hundred and forty four (144) male handball players, selected from south west zone inter university handball tournament for the year 2010- 2011, organized by S.R.T.M. University, Nanded, Maharashtra. In this study data was collected from teams who reached quarterfinals and Annamalai university team. These selected subjects, who practice handball regularly and take part in competition and their age range between 18 to 28 years. The volunteered subjects signed a separate consent form. The following team that took part in the study is listed below in Table 1.

Table 1
Teams selected for the study

Sl. No	Teams	N
1	Swami Ramanand Teerth Marathwada University	16

2	Mumbai University	16
3	University of Kerala	16
4	Rajasthan University	16
5	LNUPE, Gwalior	16
6	Acharya Nagarjuna University	16
7	Osmania University	16
8	RDVV Jabalpur University	16
9	Annamalai University	16

Variables and test

Hand Length (Wrist to Tip of 3rd Finger)

The subject place his hand on a table with the fingers together and thumb abducted. The measurement is taken with a sliding caliper from the stylium landmark identified above to the tip of the middle finger (Figure 1).

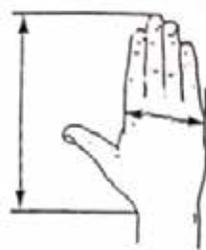


Figure 1: Hand length and width

Hand Width

This is measured as the width of the hand from metacarpal II to metacarpal V. Have the subject place his hand on a table with fingers together and thumb out to the side. With a sliding caliper measure the width of the hand at the knuckles as indicated in Figure 1.

Hand Shape index

Hand Shape index was estimated using formula proposed by Kulkasiz and Gozil (2002). [Hand shape index: Hand width x 100/ Hand length]

Statistical technique

The right and left hand shape index were statistically examined by applying analysis of variance (ANOVA). When F ratio was found significant, Tukey HSD post hoc test was applied. This statistical work was done with help of SPSS 11.5 and outputs reproduced as it is.

Results

It is clear from the study that obtained F ratio 2.966 and 3.950 ($p < .004$ and $.000$) respectively is greater than the table value of 2.51 required at 8 and 144 degree of freedom for 0.05 level of confidence. This shows that there is a significant difference exists on right and left hand shape index among various handball teams.

Since F is significant Tukey HSD post hoc test was applied and revealed significant differences on right hand shape index between LNUPE and ANU ($p < .004$), LNUPE and OU ($p < .040$). Remaining comparisons showed no significant difference on right hand shape index. Similarly on left hand shape index between KU and OU ($p < .005$), RU and ANU ($p < .025$), RU and OU ($p < .000$), LNUPE and OU ($p < .040$), OU and RDVU ($p < .038$), OU and AU ($p < .019$). Remaining comparisons showed no significant difference on left hand shape index.

Discussion

In our study it was reported that among nine teams they differ significantly in hand shape index. Skoufas (2003) reported that wider palm span and longer palm length influenced specific motor abilities such as dribble, passing, catching and ball throwing and contributed to maximizing throwing velocity. The hand shape index is significantly influenced by palm length and width. The hand bones have been documented as good anthropometric parameters and had proven to exhibit great ethnic variations (Sancho-Bru et al. 2011). The difference in hand shape index can be attributed to the population and ethnic differences between the populations. From the above view it may be suggested that variation is not only present in between races or ethnic groups but also present among individual races or ethnic groups. Chandra et al. (2011) have documented a positive correlation between hand length and hand breadth.

Conclusion

LNUPE handball players possessed greater right hand shape index and RU handball players possessed greater left hand shape index than the other team players. This shows that among south and west zone team male handball players hand shape index differ significantly.

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