INDO ASIAN SOCIAL SCIENCE RESEARCH JOURNAL

(Refereed & Peer Reviewed Research Journal)

IAP

INDO ASIAN PUBLICATION

EDITOR IN CHIEF
DR. SUMA S. NIRNI

INDEX

Research Paper 5 **Physical Education**

COMPARATIVE STUDY ON SOMATOTYPES OF ALL INDIA AND WEST ZONE INTERUNIVERSITY LEVEL MALE HANDBALL PLAYERS

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ABSTRACT

The Competitive sports demand event specific physique and body composition to achieve the success. Experts suggested that anthropometric characteristics have been considered pre-requisites for the handball game. The advantage of physique also has great carryover value for execution of all skills in handball. Objective of our study analysis and comparison of somatotypes between All India and west zone intervarsity level male handball players. For the purpose of the study total two hundred (100 each of All India and West zone Level) male handball players were selected for various competition and camps. Z-test was applied on gathered data at .05 level of significance. Results of the study revealed that mean endomorphic rating of west zone intervarsity level handball players was significantly greater than all India level male handball players. Whereas the All India Intervarsity level male handball players was significantly greater than west zone level male handball players in Mean Mesomorphy and mean Ectomorphy.

Introduction

Top level sports performance not only requires certain physical qualities like speed, endurance, power, strength and agility but also a good physical structure. Now-a-days, body build gets physical attention at the time of selection of players for games and sports where high

level competition is involved. In modern sports, anthropometric measurements and their relationship with various motor traits are important guides for coaches as well as players for making training schedules. Most of the games demand higher than normal level of speed, strength, endurance, flexibility, co-ordination and the optimum fitness of the organism. Research findings show that a high level of performance of techniques alone has very little to do with competitive sports. Scientists and physiologists have been of the view that anthropometric measurements and the physical components of an athlete have a lot to do with his performance. Along with techniques or the tactics of a player or a team, physical and physiological characteristics better performance.

Modern handball is played on a court 40 by 20 meters (131 by 66 ft), with a goal in the center of each end. The goals are surrounded by a 6-meter zone where only the defending goalkeeper is allowed; the goals must be scored by throwing the ball from outside the zone or while "jumping" into it. The sport is usually played indoors, but outdoor variants exist in the forms of field handball and Czech handball (which were more common in the past) and beach handball (also called sandball). The game is quite fast and includes body contact, as the defenders try to stop the attackers from approaching the goal. Goals are scored quite frequently; usually both teams score at least 20 goals each, and it is not uncommon for both teams to score more than 30 goals.

Uppal et.al. (1983) suggested that anthropometric characteristics have been considered pre-requisites for the game. The height is of a special advantage to the player in handball game to receive the ball, to pass the ball and for goal in throw. The advantage of height also has great carryover value for execution of all skills in handball.

Sports science has a long history of studying physique. Sheldon et al.(1940) used photoscopic and anthroposcopic methods to describe individual physique as three different Somatotype viz; (i) endomorphy (fatty: predominance of digestive organs, softness and roundness of contour throughout the body), (ii) mesomorphy (muscular: predominance of muscles, bones and connective tissues) and (iii) ectomorphy (predominance of surface area over body mass linearity. This method has basic shortcomings i.e., it does not quantify the various body dimensions, indices and ratios. The body profile technique of Mc Ardle et al. describes physique in terms of muscular and non-muscular components. The diversity in overall body dimensions can be compared among individuals or groups from that of reference man and reference woman.

The Competitive sports demand event specific physique and body composition to

achieve the success. De Garay et al.(1974) concluded that top-level performance in a particular event demands a particular type of body size and shape, if other aspects are being similar. They showed high correlation between the body profile of an athlete and specific task (event) in which he/she excelled. Various other studies also suggest that different body sizes, shapes and proportions are beneficial in different physical activities. Carter(1982) suggested that the athletes who wish to achieve success in sports at a high level should compare their physique with Olympic athletes. If the athlete's bodily structure is within the limit of the Olympians, he/she may achieve high performance subjected to the optimization of other factors. The anthropometric and compositional study on cross-country runners revealed that runners are characterized by a relatively large calf and small biceps and abdominal girths. Mc Ardle et al. pointed out that athletes generally have physique characteristics unique to their specific sports. For example field event athletes have relatively large quantities of lean tissues and a high percentage of body fat whereas long distance runners have the least amount of lean tissue and fat mass. He also pointed out that football players are amongst the heaviest and leanest of all sports men. Sharma and Dixit (1985) investigated that physique is one of the most important factors, which becomes pre-requisite for better performance in games and sports. They compared jumpers with throwers and found that the jumpers were less meso-morphic and more ecto-morphic.

Objectives of the study;

The purpose of this study is to find out the differences of somatotypes between the all India level and zone level male handball players. A

Significance of Study

The identification of talent through means and method of sports medicine, physiology, biochemistry, psychology and anthropometry however, has not proved to be satisfactory. These sciences are able to determine certain biological and physical parameters. e.g. vo2 max, heart rate, age etc. These parameters reflects only one part of human performance. This study will help to assess the possible morphological factors of the handball.

Selection of Sample:

For the purpose of the study 100 male handball players were selected from All India Inter zonal Handball tournament held at BHU Varanasi from dated 23-27 February 2016. And 100 male handball players were selected from West zone intervarsity Handball Trail held at RTM University Nagpur. Subjects were well experienced and selected from various intervarsity coaching camps and competitions. Their age ranged 18 to 25 years. The purpose

of the study was explained before all included subjects and they were agreed to become a part of study.

Design of the Study

For the purpose of this study, both the samples were considered the true representative of the entire male handball population of Indian at the time their assessment of the morphological characteristics. The present study is a status study, which did not require the investigator basically to manipulate any of the variables included in it. It was not intended to study the interaction among various variables. In all there were three samples and three variables to be investigated.

Collection of Data:

Somatotype

The following heath and Carter (1991) method was applied to determine Somatotype of subjects;

a. Endomorphy: –

$-0.7182 + 0.1451 \times {}^*\Sigma SF - 0.00068 \times {}^*\Sigma\ SF^2 + 0.0000014 \times {}^*\Sigma\ SF^3$

[Where SF = sum of triceps, sub scapular and supraillic skin fold multiplied by 170.18/height in centimeter].

b. Mesomorphy

$0.858 \times$ humerus breadth $+ 0.601 \times$ Femur breadth $+ 0.188 \times$ *Corrected arm girth $+ 0.161 \times$ *Corrected calf girth $-$ height $\times 0.131 + 4.5$

(* Subtract the triceps skin fold and calfskin fold from the arm girth and calf girth, respectively).

c. Ectomorphy: –

The ectomorphy was determined by comparing the calculated height, weight ratio (HWR) of the subject with the underline values given below.

$$HWR = \left[\frac{height(cm)}{3\sqrt{weight(kg)}} \right]$$

➤ If HWR is greater than or equal to 40.75 than ectomorphy

$= 0.732 * HWR - 28.58$

➢ If HWR is less than 40.75 and greater than 38.25 then ectomorphy
= 0.463*HWR-17.68
➢ If HWR is equal to or less than 38.25 than Ectomorphy = 0.1

Statistical Procedure

Reiterating the objective of the study, we have to point out that we intend to investigate the somatotypes between all India and west zone intervarsity level male handball players. Z - test will be used for finding the difference of somatotypes between all India and Zone level handball players. The differences in various variables of all India and west zone intervarsity level male handball players were tested at 0.05 level of Significance.

Analysis of Data
Table - 1
Endomorphy

Variable	Mean Endomorphy	Standard Deviation	Z- Value
All India Handball players	2.231394	0.32459	12.91706
West Zone Handball players	2.854294	0.356634	
The mean Endomorphy of All India Handball players is < than mean Endomorphy of west zone handball players by 21.82 %.			

* Significant at 0.05 level

** Z value for one tail test to be significant at 0.05 level 1.64

Table 1 Shows significant obtained Z value for one tail test, which leads us to conclude that the mean Endomorphy of All India level Handball players, is significantly greater (21.82%) than the mean Endomorphy of West zone level handball players.
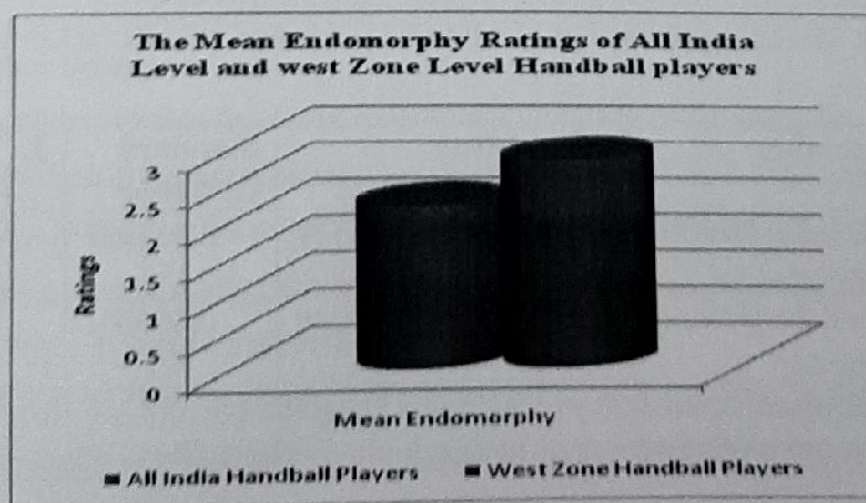
Figure - 1

Fig. 1. The Mean Endomorphy ratings of All India Level and west Zone Level Handball players

Table -2 Mesomorphy	Variable	Mean Mesomorphy	Standard Deviation	Z- Value
	All India Handball players	3.480669	0.647888	17.14887
	West Zone Handball players	1.999522	0.571154	
	The mean Mesomorphy of All India Handball players is > than mean Mesomorphy of west zone handball players by 74.075 %.			

* Significant at 0.05 level

** Z value for one tail test to be significant at 0.05 level 1.64

Table 2 Shows significant obtained Z value for one tail test, which leads us to conclude that the mean Mesomorphy of All India level Handball players, is significantly greater (74.075%) than the mean Mesomorphy of West zone level handball players.
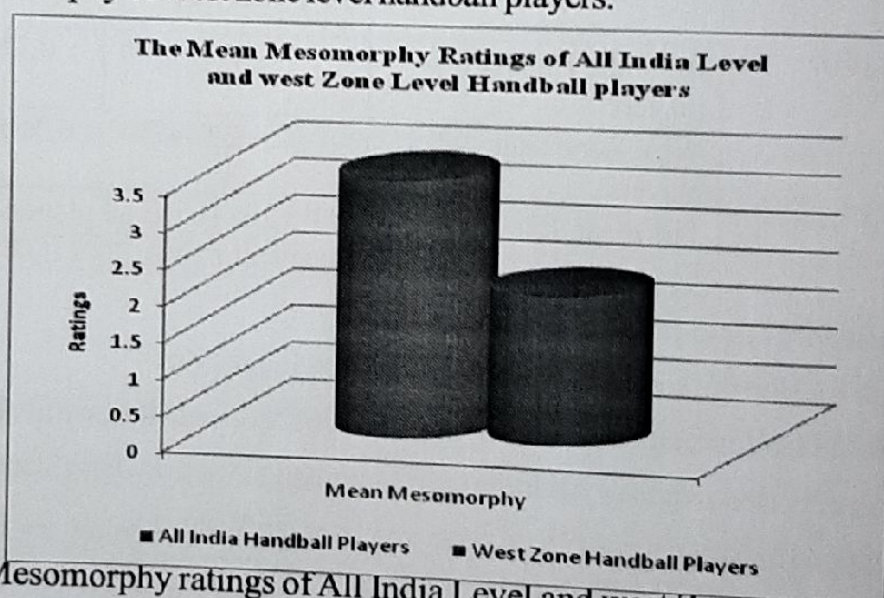
Figure - 2

Fig.2. The Mean Mesomorphy ratings of All India Level and west Zone Level Handball players

Table - 3 Ectomorphy	Variable	Mean Ectomorphy	Standard Deviation	Z- Value
	All India Handball players	1.468321	0.463999	1.120765
	West Zone Handball players	1.559299	0.666061	
	The mean Ectomorphy of All India Handball players is > than mean Ectomorphy of west zone handball players by 5.834527 %.			

* Significant at 0.05 level

** Z value for one tail test to be significant at 0.05 level 1.64

Table 3 Shows significant obtained Z value for one tail test, which leads us to conclude that the mean Ectomorphy of All India level Handball players, is significantly greater (5.834527%) than the mean Ectomorphy of West zone level handball players.
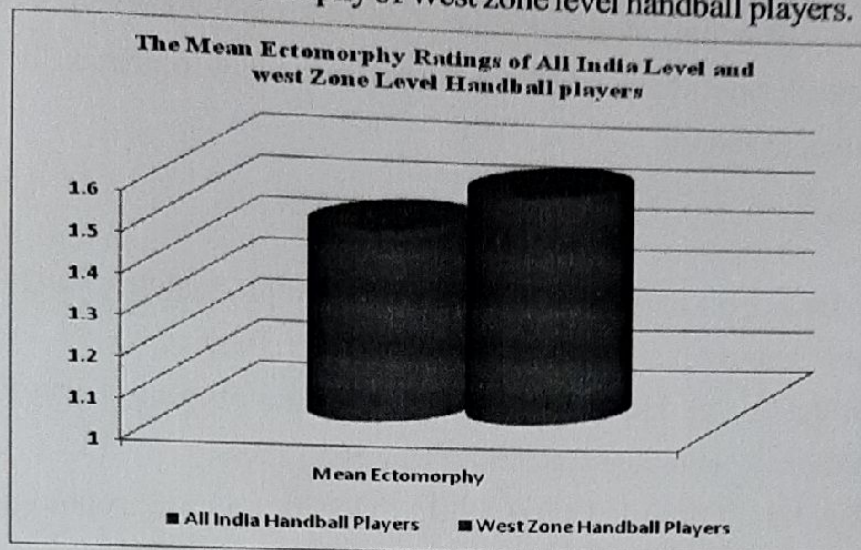
Figure - 3

Fig.3. The Mean Ectomorphy Ratings of All India Level and west Zone Level Handball players

DISCUSSION OF FINDINGS

Endomorphic rating

It is observed that mean endomorphic rating of west zone male handball players is significantly greater (21.82%) than the all India level male handball players.

The less endomorphic rating signifies greater muscular mass and lesser fat mass which provides greater speed, agility, flexibility which helps them in dribbling, running, blocking, shooting, defense in handball players.Sodhi and Sidhu (1984), observed that the Indian volleyball players had less endomorphic rating than their low performance counterparts.

Mesomorphic rating

It is observed that the mean mesomorphic rating of All India level male handball players is significantly greater than the west zone level male handball players by 74.07%. The greater the Mesomorphic rating signifies greater muscular mass and lesser fat mass which provides greater speed, agility, flexibility which helps them in dribbling, running, blocking, shooting, defense in handball players.

Sodhi et al. (1990), conducted a study on the north Indian volleyball players and found that on average the volleyball player were found to be meso-ectomorph.

Ectomorphic Rating:

It is observed that the mean Ectomorphic rating of All India level male handball

players is not significantly different than the west zone level male handball players .

Greater the ectomorphy signifies the lesser the body weight and muscular mass which become the advert effect of explosive strength, speed and relative strength. Both the all India level male handball players have specific skill and motor fitness trainings this may cause the lesser the ectomorphy ratings.

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