



International Journal of Physical Education, Sports and Health

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2017; 4(2): 313-315
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www.kheljournal.com
Received: 11-01-2017
Accepted: 12-02-2017

Dr. Mahesh Singh Dhapola
Assistant Professor, Department
of Physical Education, GGV
Bilaspur (C.G), India

Dr. Bharat Verma
Assistant Professor, Lakshmi Bai
National Institute of Physical
Education Gwalior
(M.P.), India

Relationship of body mass index with agility and speed of university players

Dr. Mahesh Singh Dhapola and Dr. Bharat Verma

Abstract

Purpose: The aim of this study was to investigate the relationships of height, weight and BMI with agility and speed of male university players.

Methodology: Total 46 male players were selected as subjects from Guru Ghasidas Vishwavidyalaya, Bilaspur, and Chhattisgarh. Age of the subjects ranged between 20 to 25 years. Selected Variables for the study were Height, Weight, BMI, Agility and Speed. Standardized test or tools like stadiometer, weighing machine, 4x10m. Shuttle run test, 50 yard dash test etc. were used to collect the data for selected variables. To find out relationship between selected variables, descriptive statistics and the Pearson's Product Moment Correlation was used.

Findings: There exists a significant relationship between Weight and Agility ($r=.670, p<0.05$), weight and speed ($r=.543, p<0.05$), BMI and Agility ($r=.546, p<0.05$) and BMI and Speed ($r=.752, p<0.05$). There were no significant correlation found between Height and Agility ($r=.164, p>0.05$) and Height and Speed ($r=.065, p>0.05$).

Keywords: Height, Weight, BMI, Agility and Speed

1. Introduction

Today, we see that in order to improve the performance of their athletes, exercise educators and teachers evaluate them in terms of healthcare, physical and movement as well as skills fitness according to a timetable. Given the nature and variety of athletic skills, stamina and player movement, as well as having some anthropometric characteristics and appropriate physical capacity, it is considered as one of the success factors in the sports scene. In addition, factors such as the size and performance indicators of motor skills in the tendency of people to a specific sport play an important role.

Motion capabilities such as speed, agility, balance, which the concept of movement has been considered have a wide range in different sports and play an important role in implementing excellent motor skills. Motion speed is considered a required physical capability for high levels of performance in many sports. Speed is the amount of movement or the distance by one of the body limbs or the whole body. Most coaches in primaries tend to be aware that whether the athletes in sprinting or other activities are faster or not. Velocity component include reaction time, acceleration, maximum speed, endurance in speed and movement time that speed test in this research relates to movement time. Agility factor is very important factor in most sports. The athlete should be able to have great maneuverability. The ability of individuals to change fast moving, with balance and understanding of the position indicates one's high agility.

All the components of physical fitness and motor fitness can be realized by different body actions. In this manner the physique of a person especially Height and Body Weight plays very important role in his motor fitness status. The puberty phase of human life is found to be most productive one for developing base for different motor abilities. It is believed that motor fitness is trainable factor but the influence of one's physique and body composition seem to play a great role in its determination as achievement of high level performance is only possible in an individual with adequate genetic predisposition and under optimal environment condition. India is vast country with unique cultural, social, geographical, ethnic and climatic differences. The motor fitness of Indian male varies according to regional variations of the country.

Correspondence
Dr. Bharat Verma
Assistant Professor, Lakshmi Bai
National Institute of Physical
Education Gwalior
(M.P.), India

The B.M.I. also varies from one region to another which ultimately affects growth and development. Sodhi, have reported that the regional variation of morphological characteristics of Indian children occur due to socio-economic, climatic and genetic variations.

Through body measurement, sports scientists will be able to gain the necessary information about the physical form, physical fitness and physical condition of athletes. Many accurate predictions about individual and team performance over the past two decades have been solely based on height and body mass. According to many experts, anthropometric indices or physical and size dimensions is of the determining factors in the exercise and has dramatically been included in the new talent finding.

Objectives of the study

- To find out the relationship of Height with speed and agility of male University players.
- To find out the relationship of Weight with speed and agility of male University players.
- To find out the relationship of BMI with speed and agility of male University players.

Methodology

Selection of Subjects

A total of 46 male University players (from Cricket, Football, Hockey and Handball) were selected from the Guru Ghasidas

Vishwavidyalaya, Bilaspur, Chhattisgarh. Age of the players was ranging between 20 to 25 years.

Selection of Variables

Keeping the feasibility criterion in mind, the researcher selected the following variables for the present study:

- Height
- Weight
- BMI
- Speed
- Agility

Criterion Measures

- BMI was calculated as weight in kilograms divided by the square of height in meters.
- Speed was measured by 50mt. dash, recorded in seconds.
- Agility was measured by 4x10mt. Shuttle Run Test, recorded in seconds.

Statistical Analysis

For determining the relationships of selected variables, descriptive statistics and the Pearson’s Product Moment Correlation were used, the data analyzed with the help of SPSS (16.0 version) software and the level of significance was set at 0.05 level of confidence.

Result and Findings of the Study

Table 1: Descriptive statistics of selected variables of male University players

Variables	N	Mean	Std. Deviation
Height	45	167.822	5.769
Weight	45	61.146	7.728
BMI	45	20.576	2.437
Agility	45	10.749	.788
Speed	45	7.126	.729

Table 1 shows that the mean and SD of height (167.822 ± 5.769), weight (61.146± 7.728), BMI (20.576 ± 2.437), Agility (10.749 ±.788) and Speed (7.126 ±.729).

Table 2: Relationship among selected variables of male University players

Variables 1	Variables 2	Coefficient of correlation (r)	Sig.
Height	Agility	.164	.254
	Speed	.065	.579
Weight	Agility	.670*	.000
	Speed	.543*	.000
BMI	Agility	.546*	.000
	Speed	.752*	.000

* Correlation is significant at the 0.05 level (2-tailed).

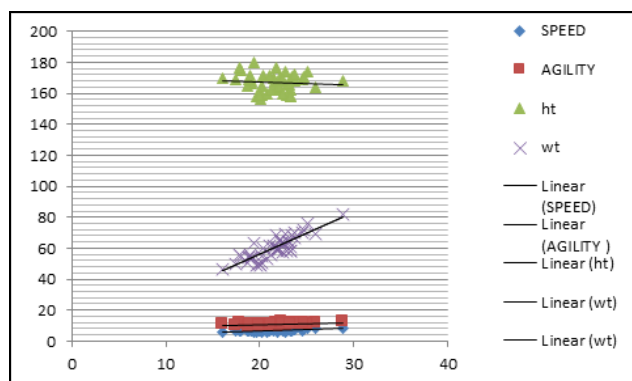


Fig 1: Graphical representation of relationship between B.M.I. and selected variables

According to Table 2 it can be seen that there are significant correlation between Weight and Agility (r=.670, p<0.05), weight and speed (r=.543, p<0.05), BMI and Agility (r=.546, p<0.05) and BMI and Speed (r=.452, p<0.05). Another hand there are no significant correlation between Height and Agility (r=.164, p>0.05) and Height and Speed (r=.065, p>0.05).

Discussion of the Findings

Taghinejad (2013) [13, 14] reviewed the relationship between anthropometric measurements and physical fitness factors of female students in Shiraz and explained the inverse significant relationship between weight and body mass index with speed that is quite consistent with the results of this study. Shafizadeh (2010) [11] reviewed the relationship between anthropometric parameters among youth at football schools with their individual skills. This study investigated the relationship between heights, weight and body mass index of teenagers with their individual skills. Results associated with this assumption indicated the significant inverse relationship between weight and running skill among 10 and 11 year olds that is consistent with the results of the second and third hypothesis. Based on the results obtained and the reliability of the results of this study, it is concluded that BMI factor has a significant negative correlation with recorded running speed. In fact, the running speed record is damaged with a high body mass index. Speed factor is of important physical fitness factors in most sports. BMI is also a standard indicator for identifying overweight, underweight, ideal weight and obesity

and is directly related to one's weight. Most research in this area indicates that higher body mass index has a weak sport performance (Taghinejad, 2013) [13, 14]. The results indicate that there is an inverse significant correlation between BMI and agility record, reviewed the relationship between body type and body composition and performance in the basic movement patterns and components of soccer basic skills. The obtained results showed that increased endomorph and increased weight in subjects causes weakening their performance in certain subjects such as dribbling and agility test that is consistent with our results. Also, it is consistent with the research results of Rahmaninia (2009). In addition Moghadasi and colleagues (2011) [6], reviewed the prevalence of overweight and obesity and fitness levels among adolescents at Shiraz city in 2010 and finally obtained a significant inverse relationship between the factors of physical fitness and body fat percentage and body mass index which was consistent with the current research results.

Agility is also very important factors for physical fitness and sport. One reason for agility enhancement can be attributed to the weight to be shifted easily in exercises. Because BMI is directly related with weight, and the results according to specified standards lose weight, overweight, normal weight and obesity can be estimated, and as previously mentioned; too much weight will cause the athlete to carry the extra load during process, causing poor performance and ultimately reduce the agility of a person.

Conclusions

On the basis of the result of the study, it can be concluded that there were significant relationship found between Weight and Agility ($r=.670, p<0.05$), weight and speed ($r=.543, p<0.05$), BMI and Agility ($r=.546, p<0.05$) and BMI and Speed ($r=.752, p<0.05$). There were no significant correlation found between Height and Agility ($r=.164, p>0.05$) and Height and Speed ($r=.065, p>0.05$).

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