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Relationship between Selected Anthropometric Measurements and Performance of Female Handball Players of Delhi State.

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Abstract

The study was conducted to establish the "Relationship between Selected Anthropometric Measurements and Performance of female handball Players". The selected Anthropometric Measurements were weight, height, sitting height, leg length, upper leg length, lower leg length, arm length, upper arm length and lower arm length. The performance of female handball players, studying in Delhi University was assessed by the three experts out of 10 marks. The data was collected on the group of 35 female handball players with the help of selected anthropometric variables and performance score.

For the analysis of data, mean, standard deviation and Pearson's product moment correlations were employed as the statistical techniques. The findings revealed that the performance was significantly related with selected Anthropometric variables. The height, leg length, arm length, lower arm length are highly correlated with performance score at .01 level of significance. Similarly, other variables such as, weight, sitting height, lower leg length, upper arm length are significantly correlated with performance score at .05 level of significance.

Keyword: Performance, Anthropometric, Weight, Height, Sitting Height, Leg Length, Upper Leg Length, Lower Leg Length, Arm Length, Upper Arm Length And Lower Arm Length.

Introduction

Millions of people take part in sports activities for either recreational purpose or for health strength and fitness purpose and for displaying superiority over others in competitive sports. Some competitive games and sports are taking shapes of profession with high skills, and with ample financial benefits linked with high degree of popularity. The sports –scientists almost all over the world is exploring new methods and techniques in various sports discipline to accomplishes what appears to be impossible. International performances in various sports and games are influenced by many factors such as level of physical, physiological and psychological abilities, nutrition, techniques, tactics, physique, body size and body composition.

Particular type of body- size, body shape and proportions are important pre-requisites for successful participation in many sports. However, physique and body composition, to a large content, set the limits or predisposes an individual to a certain type of athletic ability. Competitions are so tough, now a days that even very small factors influencing sports performance and plays an important role in achieving position in the competitions. Physique and body composition plays an important role in acquiring the best performance.

There is a wealth of scientific and empirical evidences to support the claim that there are body size differences among athletes in different sports and games and among events within the same sports. With regards to height, weight and body size certain dimensions are necessary for success in selected events or sports. However, weight and huge body size are required to achieve optimum performance in some sports whereas lighter and smaller physique is required to achieve optimum performance in some other sports.

As evident from the historical resume, anthropometry, as measurement of the body structure, happens to be one of the oldest types of body assessment as an earlier form of testing in physical education, to prescribe ones according to muscle size of an athlete with emphasis on muscle symmetry and proportion. For centuries, measurement of body, size and proportion have been studied because of the relationship between the measurements and body functions. The study of human physical

measurement is, therefore, predominantly knows NNUFNNUF as "Anthropometry", and has wide application to the essential parameters nuufnuunuufconstituting the selective diagnostics of any game or sports.

The scientific terminology given to the measurements of man is 'Anthropometry' which is a word synthesized from two Greek words- 'Anthrops' means man and 'Metreein' means to measures.

Anthropometry is the science of measuring the body of man. As a special science, sports science is widely using the element of 'anthropometry' extensively, because of the utility of the sciences in measuring and watching the growth of child, selection of sports person, making them more successful, by emphasizing on their structure of the body, based on the anthropometrical norms.

Anthropometric studies consider the human body a system which performs certain tasks because it has certain basic materials available to it, namely the muscles, skeletons, tissues, axis and nervous outlook. The relationship between body size and an athlete's performance has been summarized intelligibly and concisely by Astrand and Rodhal (1970), according to whom, body size is an important factor in all types of sports performance which involves an athlete's acceleration of the body, moving it over a distance, lifting it, turning it, exerting maximum force and throwing it over. Taller persons are reported to have greater strength in proportion to their size, thus having advantage in jumping events due to the higher placement of the centre of gravity. Similarly, in throwing events since taller persons can launch their missiles from a greater height, they remain slower in acceleration of the body.

The anthropometric measurements include items, such as weight, total height as well as the width, depth and the circumference of the chest. Recent interest in anthropometric measurements focus on three areas, namely growth measure, body types, and body compositions. The use of such measurements includes classification, prediction of growth patterns and success in motor activities.

Introduction of Handball and how it is played

The game very much popular in all over the world and is spreading its popularity very much rapidly is named as the game of 'Handball'. The modern version of the game of handball that everybody knows today actually came into existence in the ending part of the 19th century in northern Europe, primarily Denmark, Germany, Norway and Sweden.

After the invention of the modern version of handball the game started to be more and more popular in the central and northern European countries. The first ever rules for the modern handball was drawn up by Dane Holger Nielsen in the year of 1898 and published them in 1906.Team handball has been described as a combination of soccer, basketball and ice hockey. The object is to score by throwing. A player can move the ball by dribbling it, by passing & throwing it towards other player. Only the goalkeeper is allowed to handle & hit the ball with any part of the body.

It's against the rules to carry the ball more than three steps or to hold it for more than three seconds. Shots on the goal must be taken from outside the goal circle, an area in which only the goal tender is allowed. Minor violations of the rules allow a team a free throw, which is an unhindered pass to a teammate, usually from a spot near where the foul was committed. Penalty throw at the goal, awarded for more serious infractions are taken from a mark just outside the goal circle.

Modern handball is a fast game, characterized incredible athletic performance by athletes. In fact, modern handball players are able to perform any different moves, jumps running change of directions, and technical movements in very short time. Running with and without the ball, in line and with different paths, jumps, throwing, passing and receiving in motion or during flight represent the technical characteristics of a top handball player.

Then, to excel at the higher levels, it is therefore important that the athlete in a particular technique must possess such typical characteristics, which are of great advantage to him/her and will help an athlete to perform during the competitions.

In the game of handball, players are of medium stature though depending upon nature of different activities determines different types of requirement for body physique.

Taller, heavier with broader shoulders and narrower hips, longer lower and upper extremities that provide mechanical advantage in feinting at the time of the shooting and the body momentum gained through running.

It may be concluded that the forward players are quite different from play maker and pivot player. They are relatively taller, heavier with broader shoulders, better developed lean tissue in the thighs. The pivot players are the intermediate in the body size, shape and proportion of the body. However, play maker is taller and heavier than pivot players. It is because pivot player have to move, a little as possible. Their work is to move and make a screen/space for their team mates, so they can easily make a goal. As a result, pivot players are shorter, lighter and slender in all anthropometric measurements and body surfaces area.

Today, it has been realized that the champions in different sports differ in their anthropometric characteristics particular requirements of their respective events. Studies have shown that top level performance is not entrusted, if the anthropometric- body dimensions of mechanical aspect of the game concerned. Therefore, it has been observed that apart from other factors the performance of a sportsman in any sports and game is influenced by various specific characteristics of physique, body composition, physiological traits and physiological functions which helps her to attain better performance.

Objective And Hypothesis

A primary goal of this paper was to determine the correlation between selected anthropometric variables and performance score of Female Handball Players of Delhi State are interrelated. It was hypothesized that anthropometric measurements in height, sitting height, leg length, arm length will have higher co-relation with handball playing ability.

Procedure and Methodology

A total of 35 level female handball players of Delhi state were randomly selected as subjects for the purpose of the present study. The following anthropometric variables were chosen for the purpose of the study. They are: standing height, sitting height, weight, leg length, lower leg length, upper leg length, arm length, lower arm length, upper arm length. The following criterion measures were used: the weight scale measured weight to the nearest 100gms, height and arm length was measured nearest 1/10 of a cm, sitting height was measured to the vertical distance from the point of vertex to sitting height and leg length was measured b/w the greater trochanter and the standing surface to the nearest 1/10 of a cm for the selected anthropometric variables by means of using the authentic scientific anthropometric tools (anthropometric rod, weighing machine, sliding calliper , anthropometric compass and sitting table).The data was collected from 35 female handball players of Delhi state b/w the age group of 17 to 25 yrs.

The collected data was analyzed by computing mean, standard deviations, pearson's product-moment co-efficient of correlation at .05 level of significance.

Analysis of Data and Results of The Study

The results and findings are analysed and interpreted in different table as follows:

Table-1

Mean and standard deviation of selected anthropometric variables.

S.No	Variable	Mean	Std.Dev.
1	Weight	50.48	5.28
2	Standing Height	154.91	3.85
3	Sitting Height	79.03	6.32
4	Leg Length	86.82	7.38
5	Upper Leg Length	47.80	3.82
6	Lower Leg Length	43.80	1.99
7	Arm Length	59.73	4.68
8	Upper Arm Length	29.15	3.20
9	Lower Arm Length	31.00	4.21

N =35

The table -1 shows descriptive statistical analysis of the mean and standard deviation of all the selected anthropometric variables of female handball players of Delhi state.

Table-2

Relationship Between Selected Anthropometric variables And Performance.

S. NO	Variables Correlated	Correlation Coefficient ('r' value)
1	Weight and performance score	.324*
2	Height and performance score	.828**
3	Sitting Height and performance score	.468*
4	Leg Length and performance score	.481**
5	Upper Leg Length and performance score	.178
6	Lower Leg Length and performance score	.655*
7	Arm Length and performance score	.533**
8	Upper Arm Length and performance score	.352*
9	Lower Arm Length and performance score	.658**

N=35

Significant at 0.05 level- r= 0.05(33)=0.296

Significant at 0.01 level- r= 0.01(33)=0.409

It is evident from the table-2 that there is significant correlation between the selected Anthropometric variables and performance. Table further shows that the relationship between the performance and height, performance and Sitting Height, performance and Weight, performance and Leg Length, performance and Upper Leg Length, performance and Lower Leg Length, performance and Arm Length, performance and Upper Arm Length, performance and Lower Arm Length were found to be 324,.828,.468,.481,.178,.655,.533,.352,658 respectively were significantly higher than the required 'r' value of 0.296.

Conclusion

The findings revealed that the performance was significantly related with selected Anthropometric variables. The height, leg length, arm length, lower arm length are highly correlated with performance score at .01 level of significance. Similarly, other variables such as, weight, sitting height, lower leg length, upper arm length are significantly correlated with performance score at .05 level of significance. The higher correlation may be attributed to the fact that handball is the game which involves different skills, namely, shooting, throwing which in turn involve arms and legs extensively and probably the person with longer arm length is in advantage side where his performance was very much affected by the length of the extremities. Handball is such a game in which height is one of the most contributing factor in performance and all the other variables are the contributing factors to the height of an individual which further contribute to better performance.

It was hypothesised that greater co-relationship was found between performance and selected anthropometric variable, hence the hypothesis is partially accepted.

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