

ANALYSIS OF ANTHROPOMETRIC MOTOR FITNESS AND PHYSIOLOGICAL PARAMETERS IN RELATION WITH HANDBALL PLAYING ABILITY

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ABSTRACT

The purpose of the present study was to analyze the anthropometric, motor fitness and physiological parameters in relation with handball playing ability. For the purpose of assessing the playing ability of handball players from selected anthropometric measurements, motor fitness components and physiological parameters thirty men handball players from Annamalai University, Chidambaram were selected as subjects. The age of the selected subjects were ranged from eighteen to twenty three years. Pearson product-moment correlation between criterion variables and the determinant variables and inter correlations among determinant variables were calculated. The result of the study reveals that the handball playing ability was highly correlated with the selected anthropometric measurements such as height, arm length, leg length and selected motor fitness components namely speed, agility and grip strength, selected physiological parameters such as resting heart rate, mean arterial pressure and vital capacity of the handball players.

Key words: Anthropometric, motor fitness and physiological parameters and handball playing ability

INTRODUCTION

The ability of a player in a team game like handball depends largely in the various anthropometric and physical parameters of the players. Present day science is very much interested in estimating the optimum anthropometric make-up of a player. So the scanning and selection of a particular player may be achieved successfully to a great extent by measuring anthropometric components.

There are numerous factors, which are responsible for the performance of a sports person. The physique and body composition including the size, shape and form are known to play a significant role in this regard. The performance of the sports men in any game depends on skill training, motivation and on various other physiological and biochemical factors. Age, sex and physical growth have also been noticed to influence a person's capacity for physical activities.

In sports and games, the experts attempt to predict the success of an individual during

competition. Their prediction is based on body composition, Physical fitness factors, physiological factors and skills. There are a number of important performance pre-requisites for good performance in a sport. Some of the factors are aerobic capacity, the ability to use anaerobic resources, mobility agility, balance, speed, strength, power, endurance, skill perfected techniques, tactics, intelligence, co-ordination, good eye sight, peripheral vision, reaction time, perceptual ability, motivation, concentration, dedication, adequate rest, food, sleep, coaching facilities, specific physical preparation etc., countless physiological factors and psychological factors are there which aid achievement. Naturally all the athletes do not have all these features at their disposal. Once we know these pre-requisites and their relative importance, we can select those sportsman or youngsters who have the potential of achieving high level in these pre-requisites and their relative importance, we can select those sportsman or youngsters who have the potential of achieving high level in these pre-requisites at a later stage.

METHODOLOGY

Subjects and Variables

For the purpose of assessing the playing ability of handball players from selected anthropometric measurements, motor fitness components and physiological parameters thirty men handball players from Annamalai University, Chidambaram were selected as subjects. The age of the selected subjects were ranged from eighteen to twenty three years. The selected anthropometric measurements such as height, weight, arm length, leg length and motor fitness components namely speed, agility, grip strength and physiological parameters such as resting heart rate, mean arterial pressure and vital capacity are selected as determinant variables. The subjective rating of the experts, who were designated to evaluate the handball playing ability (criterion variable) of the selected subjects.

Statistical Techniques

Pearson product-moment correlation between criterion variables and the determinant variables and inter correlations among determinant variables were calculated using the formula.

$$r_{xy} = \frac{NE_{xy} - (E_x)(E_y)}{\sqrt{[NE_{xx} - (E_x)^2][NE_{yy} - (E_y)^2]}}$$

The amount of correlation necessary to reject null hypothesis, at 0.05 level of significance (for inter correlation) and 0.01 level of significance (for test-retest correlations) was obtained from Table -E given by Clarke and Clarke.

Table – I: Inter Correlation Matrix

	Playing ability	Height	Weight	Arm Length	Leg Length	Speed	Agility	Grip Strength	Heart rate	MAP	Vital capacity
Playing ability	1.000										
Height	0.727	1.000									
Weight	0.178	0.626	1.000								
Arm Length	0.585	0.346	0.594	1.000							
Leg Length	0.614	0.741	0.495	0.013	1.000						
Speed	0.398	0.467	0.602	0.175	0.863	1.000					
Agility	0.450	0.538	0.048	0.633	0.016	0.079	1.000				
Grip Strength	-0.402	-0.382	0.161	0.302	0.116	0.466	0.157	1.000			
Heart rate	-0.550	-0.411	0.068	0.321	0.251	0.368	0.208	0.758	1.000		
MAP	0.833	0.768	0.151	0.452	0.245	0.206	0.442	0.213	-0.403	1.000	
Vital capacity	0.485	0.550	0.281	0.117	0.343	0.126	0.409	0.568	-0.598	0.679	1.000

* Significant 0.05 level

(Table value required is 0.361 for 28 degrees of freedom)

The correlation coefficient between handball playing ability with selected anthropometric measurements have been presented in table-II

Table– II: Correlation Coefficient between Handball Playing Ability and Selected Anthropometric Measurements

S.No	Variables Correlated	Obtained 'r' Value	Required 'r' Value
1	Handball playing ability with Height	0.727*	0.361
2	Handball playing ability with Weight	0.178	0.361
3	Handball playing ability with Arm Length	0.585*	0.361
4	Handball playing ability with Leg Length	0.614	0.361

* Significant 0.05 level

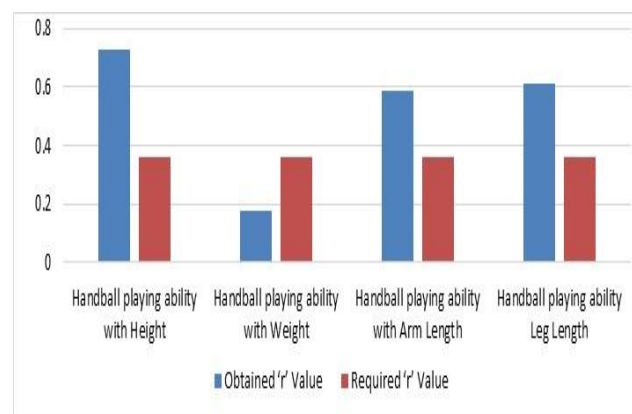
The correlation coefficient between handball playing ability with height, arm length, leg length are significant at 0.05 level, since the obtained values of 0.727, 0.585, and 0.614 respectively are greater than the required value of 0.361 for 28 degrees of freedom. However the correlation coefficient between handball

RESULT

To realize the objectives of this study, relationship between the criterion and determinant variables and inter relationship between determinant variables were calculated using the method of product moment correlation. The correlation coefficient thus obtained is presented in table-I.

playing ability with weight is insignificant, since the obtained values of 0.178 is lesser than the required table value of 0.361. The result of the study shows that the handball playing ability was highly correlated with height, arm length and leg length. The Obtained and required 'r' Value of handball playing ability with selected anthropometric measurements have been graphically represented in figure-I.

Figure-I: Diagram Showing the Obtained and Required 'R' Value of Handball Playing Ability with Selected Anthropometric Measurements



The correlation coefficient between handball playing ability with selected motor fitness components have been presented in table-III

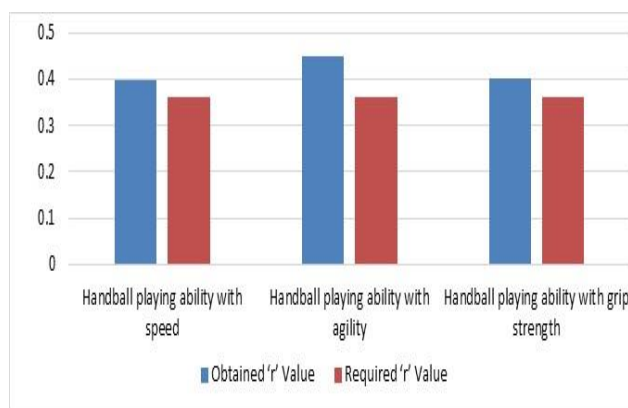
Table– III: Correlation Coefficient between Handball Playing Ability and Selected Motor Fitness Components

S.No	Variables Correlated	Obtained 'r' Value	Required 'r' Value
1	Handball playing ability with speed	0.398*	0.361
2	Handball playing ability with agility	0.450*	0.361
3	Handball playing ability with grip strength	0.402*	0.361

* Significant 0.05 level

The correlation coefficient between handball playing ability with speed, agility, grip strength are significant at 0.05 level, since the obtained values of 0.398, 0.450, and 0.402 respectively are greater than the required value of 0.361 for 28 degrees of freedom. The result of the study shows that the handball playing ability was highly correlated with speed, agility and grip strength. The Obtained and required 'r' Value of handball playing ability with selected motor fitness components have been graphically represented in figure-II.

Figure-II: Diagram Showing the Obtained and Required 'R' Value of Handball Playing Ability with Selected Motor Fitness Components



The correlation coefficient between handball playing ability with selected physiological parameters have been presented in table-IV

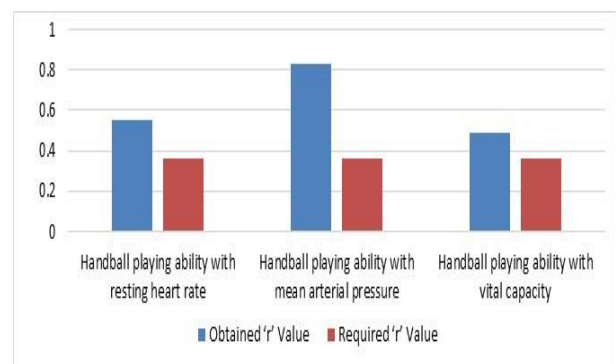
Table– IV: Correlation Coefficient between Handball Playing Ability and Selected Physiological Parameters

S.No	Variables Correlated	Obtained 'r' Value	Required 'r' Value
1	Handball playing ability with resting heart rate	0.550*	0.361
2	Handball playing ability with mean arterial pressure	0.833*	0.361
3	Handball playing ability with vital capacity	0.485*	0.361

* Significant 0.05 level

The correlation coefficient between handball playing ability with resting heart rate, mean arterial pressure and vital capacity are significant at 0.05 level, since the obtained values of 0.550, 0.833, and 0.485 respectively are greater than the required value of 0.361 for 28 degrees of freedom. The result of the study shows that the handball playing ability was highly correlated with resting heart rate, mean arterial pressure and vital capacity. The Obtained and required 'r' Value of handball playing ability with selected physiological parameters have been graphically represented in figure-I.

Figure-I: Diagram Showing the Obtained and Required 'R' Value of Handball Playing Ability with Selected Physiological Parameters



DISCUSSION

For many years it was believed that skill perfection and motor components were of greater importance. But now, besides all these it is recognized that anthropometric components and physiological components are needed for high level of performance.

Anthropometry is the science of measuring the human body and its parts. It is used as an aid to the study of human evolution and variation. It has been observed that top athletes in some sports tend to have those proportions to biologically aid the performance (Mathews, 1973).

For a good performance in any games or athletic event, achievement of a high standard of fitness is a basic requirement. More participation in sports activity is not enough to improve fitness, because fitness must be gained only through conditioning programme. According to Sathyanesan (1997) physical fitness is the capacity of an individual to perform a given task. Greater the physical fitness the better the physical endurance and precision of movement will be, which are essential for our daily work of life. The greater the physical fitness, the longer can a person work and the more efficient will be his performance and his capacity for recovering from fatigue (Willgoose, 1961).

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

CONCLUSION

The result of the study reveals that the handball playing ability was highly correlated with the selected anthropometric measurements such as height, arm length, leg length and selected motor fitness components namely speed, agility and grip strength, selected physiological parameters such as resting heart rate, mean arterial pressure and vital capacity of the handball players.

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