

**PREDICTION OF ANTHROPOMETRICAL AND PSYCHOLOGICAL VARIABLES
CORRELATED WITH PLAYING ABILITY AMONG SOUTH ZONE INTER
UNIVERSITY BASKETBALL PLAYERS**

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Abstract

The purpose of the present study was to predict the anthropometrical and psychological variables correlated with playing ability among South Zone Inter University women Basketball players. To achieve this purpose of the study, forty eight women basketball players who have represented the qualifying teams namely Hindustan University, Chennai, University of Madras, Chennai, SRM Institute of Science and Technology, Chennai and Jain University, Bengaluru during the academic year 2019-2020 were randomly selected as subjects. The age of the subjects were ranged between 18 to 25 years. All the subjects were tested on selected anthropometrical and psychological variables such as height, weight, arm length, thigh circumference, calf circumference, sports competition anxiety, achievement motivation and playing ability were chosen as reliant factors for this study by using the standardized test items. To determine the relationship between dependent variable and independent variables, the one way analysis of variance was used to find out the significant differences, if any, among the qualified teams in the South Zone Inter University women basketball tournaments for each criterion variables separately. The results of the study showed that there was a significant relationship between playing ability on selected anthropometrical and psychological variables such as height, weight, arm length, thigh circumference, calf circumference, sports competition anxiety and achievement motivation among south zone inter university women basketball players.

Keywords: Playing Ability, Height, Weight, Arm Length, Thigh Circumference, Calf Circumference, Sports Competition Anxiety and Achievement Motivation.

I. INTRODUCTION

Sports performance is the result and expression of the total personality of the sportsman. The development of sportsperson to enable to achieve high-level performance is usually concentrated in four areas namely physical, power and social and adjustment. One of the objectives of logical research is to foresee future occasions or results from present or

past information. There are diverse sorts of expectation and in view of some well established realities thus they are solid forecast. Research in the field of games and amusements had demonstrated that the future execution of an individual or group could be anticipated through the investigation of specific factors, which are observed to be the reason for add up to execution. Among many elements the accompanying factors, for example, anthropometrical, physical and physiological factors that choose the playing capacity of an individual are more imperative. Ball is one of the group based games and it is played the two men and ladies all through the world.

Anthropometric is not merely an ensemble of technique and measurements, but it is a robust method for description and analysis of body size, shape, form and proportion. The Anthropometric measurement relates to the body mass as the health personnel does not appreciate its potential value. Anthropometric measurements relevant to human movement gained formal recognition as a discipline with the inauguration of the International Society for Advancement of Kinanthropometry in 1986. Anthropometrists of all continents have participated in several major multidisciplinary studies that are being or have been conducted to assess the physical characteristics of people. Kinanthropometry has been defined as the quantitative interface between human structure and function. This interface is analyzed through the estimation and examination of age, body measure, shape, extent, piece and development as they identify with net body work. Past reports have demonstrated that body structure and morphological qualities are critical determinants of execution in many games and certain physical impressions, for example, body arrangement (muscle versus fat, weight, bulk) and constitution (somatotype) can altogether impact athletic execution (**Carter & Carter, 2001**).

Previous bunch of anthropometrical studies reports have shown that body structure and morphological characteristics can determine the selection of participants in many sports. The knowledge of the physical characteristics of Basketball players could provide insight into those individual factors which influence the players performance in the game. In particular the particular utilization of anthropometric estimations which assumes a fundamental part in complex group based diversions. Key range that assumes an imperative part in b-ball achievement is a player's physical wellness and body measure. The cutting edge round of ball has advanced to the point where tall, substantial players are specially enlisted to key positions.

In performance and high performance sport, a great importance is given to the physical condition. Basic and specific motor abilities such as strength, coordination, as well

as agility and speed, which are indispensable for the efficient solving of game situations. Basketball is an endurance game. Without endurance the player cannot perform well, in the same time the player's need all the characteristics i.e. speed, agility, co-ordination etcetera. Nowadays most of the players having good height can perform well in the game situation. Without physical characteristics players cannot achieve the aim of the game, so physical characteristics is very essential for the better performance of basketball.

Basketball game is played all over the world. Over the years this versatile game is played all over the world. Over the years this versatile game has established an important role due to its physical and educational values as well as to its tremendous dynamics. The attraction of the basketball game lies in the fact that it is fast moving and played on small court. All the competitive level basketball demands a high level of technical and tactical skills and attributes of speed, strength endurance and mobility. Basketball is a game of movements. Somebody once said "when the going gets tough the tough get going to avoid a breakdown of still like missing on easy shot, throwing a bad pass or losing opponent competition game conditions (Ambler, 1979).

Sports psychology in many ways is a fortunate scientific field of inquiry. Researchers are afforded many opportunities to observe, describe, and explain the various psychological factors that influence diverse aspects of sport and physical activity. Sports psychology is defined as the scientific study of human behaviour in sport. Such as the other discipline within sports and exercise science, sports psychology can be applied to varied skilled movement physical activities and exercise programmes, such as corporate fitness, exercise rehabilitation and health-oriented exercise programmes as well as traditional physical education and competitive athletics. Sports psychology has emerged as a legitimate field of scientific inquiry. As with all scientific endeavours, sports psychology shares the same primary goals of science, the observation of events, the description of phenomena, the explanation of the factors that influences events in systematic manner, the prediction of events or outcomes based upon systematic and reliable explanations and ultimately, the control of events or contingencies that result in expected outcomes. Sports psychology in many ways is a fortunate scientific field of inquiry. Researchers are afforded many opportunities to observe, describe, and explain the various psychological factors that influence diverse aspects of sport and physical activity (Clarke, 1986).

Sports psychology, when viewed as a sub-discipline within the broader field of psychology, would be defined as applied psychology or as a field of study in which the principles of psychology are applied. Although sports psychology has not been recognised

traditionally as a sub-disciplinary area of study within the field of academic psychology. Scientists recently suggested that sports psychology is ready to be embraced by the mainstream of psychology. The view of sports psychology as a sub-discipline within the field of sports and exercise science comes mostly from scientists in physical education. They argued that the academic discipline of physical education consists of the study of certain aspects of such field as psychology physiology and anatomy. In this modern era of competition, the psychological preparation of an individual is as much as necessary as teaching the different skills of sports along with clear lines.

One of the objectives of logical research is to foresee future occasions or results from present or past information. There are diverse sorts of expectation and in view of some well established realities thus they are solid forecast. Research in the field of games and amusements had demonstrated that the future execution of an individual or group could be anticipated through the investigation of specific factors, which are observed to be the reason for add up to execution. Among many elements the accompanying factors, for example, anthropometrical, physical, physiological and psychological factors that choose the playing capacity of an individual are more imperative. Ball is one of the group based games and it is played the two men and ladies all through the world.

II. LITERATURE REVIEW

Sisic et. al., (2015) evaluated the influence of anthropometric variables and power capacities on basketball specific pre planned agility performances. The participants were 92 high level, junior age basketball players (16-17 years of age; 187.6 ± 8.72 cm in body height, 78.40 ± 12.26 kg in body mass), randomly divided into a validation and cross validation subsample. The predictors set consisted of 16 anthropometric variables, three tests of power capacities (Sargent jump, broad jump and medicine ball throw) as predictors. The criteria were three tests of agility: a T shape test; a Zig Zag test, and a test of running with a 180 degree turn (T180). Forward stepwise multiple regressions were calculated for validation subsamples and then cross validated. Cross validation included correlations between observed and predicted scores, dependent samples t test between predicted and observed scores; and Bland Altman graphics. The results highlighted the importance of sport specific tests when studying pre--planned agility performance in basketball. The improvement in power capacities will probably result in an improvement in agility in basketball athletes.

Devaraju (2014) examined the Kabaddi playing ability with selected Anthropometrical variables among College level Players. One hundred and twenty six

male inter collegiate Kabaddi players were randomly selected from various colleges in Tamilnadu state, India and their age ranged between 18 and 28 years. The subjects had past playing experience of at least three years in Kabaddi and only those who represented their respective college teams were taken as subjects. A series of anthropometrical measurements was carried out on each participant. These included Standing height measured by Stadiometer; Body weight measured by weighing machine, Two Length measurements- Arm length, Leg length, measured by Lufkin Anthropometric Tape. The data were collected by following standard testing protocol of International Society for the Advancement of Kinanthropometry. The playing ability which was taken as the performance factor was subjectively assessed by three qualified Kabaddi coaches. All testing was done two day before inter - collegiate competition by using scientifically approved equipments. Mean and Standard deviations were calculated for each of the selected variables. The inter-relationship among the selected anthropometrical, physical, physiological and psychological variables and Kabaddi playing ability, were computed by using Pearson's product-moment correlation coefficients. The results revealed that an Inter- relationship exists significantly between the anthropometrical variables among male inter-collegiate Kabaddi players.

Viswanathan & Chandrasekaran (2011) predicted the role of a number of anthropometric characteristics in performance of Indian youth elite Basketball players with special reference to their playing positions. Two hundred and seventy six (age, 15.1 ± 1.3 years) youth elite male Basketball players from 23 states of India participated in the 26th Lakadawala Youth National Basketball Championship at Mastan YMCA, Mumbai from 9th to 16th May 2009, were selected as the subjects. The selected subjects were divided into three groups according to their playing positions namely Guard (GD = 72), Forward (FD = 126) and Centre (CR = 78). The selected anthropometric variables namely Body weight, Skinfold measurements (mm) - Biceps, Subscapular, Triceps, Supraspinale, Abdominal, Iliac Crest, Front Thigh and Medial Calf; Girth measurements (cm) - Arm girth relaxed, Arm girth flexed and Calf girth; Length measurements (cm) - Standing height, Arm span, Arm length, Leg length and Breadth measurements (cm) - Humerus breadth and Femur breadth as the independent variables were taken for this study. The data were collected by following standard testing protocol of International Society for the Advancement of Kinanthropometry (ISAK) during the competition by scientifically approved equipments. The criterion variable, playing ability of the selected Basketball players are assessed by three qualified Basketball coaches. To

determine the relationship between the selected anthropometric variables and the coaches rating on playing ability, the coefficient of correlation was used. The results revealed that there was a strong correlations ($r = 0.9$) exists between the playing ability versus height, weight, arm length, arm span, leg length and flexed arm girth among all the playing positions.

III. METHODOLOGY

The purpose of the present study was to predict the anthropometrical and psychological variables correlated with playing ability among South Zone Inter University women Basketball players. To achieve this purpose of the study, forty eight women basketball players who have represented the qualifying teams namely Hindustan University, Chennai, University of Madras, Chennai, SRM Institute of Science and Technology, Chennai and Jain University, Bengaluru during the academic year 2019-2020 were randomly selected as subjects. The age of the subjects were ranged between 18 to 25 years. All the subjects were tested on selected anthropometrical and psychological variables such as height, weight, arm length, thigh circumference, calf circumference, sports competition anxiety, achievement motivation and playing ability were chosen as reliant factors for this study by using the standardized test items.

The anthropometrical variables were measured by stadiometer, weighing machine, flexible measuring tape respectively were measured in meters, kilograms and centimetres. The psychological variables were measured by Rainer Marten's Sports Competition Anxiety Test Questionnaire and M.L. Kamlesh's Achievement Motivation Test Questionnaire respectively were measured in points.

IV. RESULTS AND DISCUSSION

To determine the relationship between dependent variable and independent variables, the one way analysis of variance was used to find out the significant differences, if any, among South Zone Inter University women basketball players.

The mean, standard deviation and F ratio value on height, weight, arm length, thigh circumference, calf circumference, sports competition anxiety, achievement motivation and playing ability among South Zone Inter University women basketball players presented in Table I and Table II.

Table - I: Mean, Standard Deviation on Height, Weight, Arm Length, Thigh Circumference, Calf Circumference, Sports Competition Anxiety and Achievement Motivation among South Zone Inter University Women Basketball Players

Variables	Test	Hindustan University	University of Madras	SRM Institute of Science and Technology	Jain University
Height	Mean	165.33	167.67	167.17	167.0
	SD	5.26	4.71	9.62	4.86
Weight	Mean	56.25	56.83	57.92	58.33
	SD	1.54	1.19	0.66	0.65
Arm Length	Mean	72.17	74.17	72.08	71.75
	SD	2.51	2.58	5.04	2.59
Thigh Circumference	Mean	48.08	50.25	50.08	48.42
	SD	1.44	2.37	3.02	2.19
Calf Circumference	Mean	37.33	39.42	38.58	39.33
	SD	1.37	1.78	1.24	1.67
Sports Competition Anxiety	Mean	17.50	17.58	16.67	16.67
	SD	0.522	0.67	0,49	0.65
Achievement Motivation	Mean	24.33	24.25	22.17	22.83
	SD	0.65	0.62	0,83	1.03

Table – II: Analysis of Covariance on Height, Weight, Arm Length, Thigh Circumference, Calf Circumference, Sports Competition Anxiety and Achievement Motivation among South Zone Inter University Women Basketball Players

Variables	Source of Variance	Sum of Square	Df	Mean Square	Obtained 'F' Ratio
Height	Between	36.917	3	12.306	0.296
	Within	1829.00	44	41.568	
Weight	Between	33.167	3	11.056	9.446*
	Within	51.500	44	1.170	
Arm Length	Between	43.417	3	14.472	1.283
	Within	496.50	44	11.284	
Thigh Circumference	Between	44.917	3	14.972	2.76
	Within	239.00	44	5.432	
Calf Circumference	Between	33.50	3	11.167	4.763*
	Within	103.167	44	2.345	
Sports Competition Anxiety	Between	9.229	3	3.076	8.876*
	Within	15.250	44	0.347	
Achievement Motivation	Between	41.229	3	13.743	21.405*
	Within	28.250	44	0.642	

* Significant at .05 level of confidence.

(Table value required for significance with df 3 and 44 was 2.82)

Table II demonstrates that the obtained “F” ratio value for height was 0.296, arm length was 1.283, thigh circumference was 2.76 which was lesser than the required Table value 2.82 with df 3 and 44 at .05 level of confidence. The results find that there is no significant difference on height, arm length and thigh circumference among South Zone Inter University women basketball players.

Table II also demonstrates that the obtained “F” ratio value for weight, calf circumference, sports competition anxiety and achievement motivation were 9.446, 4.763, 8.876, 21.405 and 25.534 respectively which is greater than the required Table value 2.82 with df 3 and 44 at .05 level of confidence.

The results find that there is a significant difference in weight, calf circumference, sports competition anxiety, achievement motivation weight, calf circumference, sports competition anxiety and achievement motivation among South Zone Inter University women basketball players.

Playing Ability

The mean, standard deviation and F ratio value on playing ability among the qualifying teams for the All India Inter University Basketball Tournament in the South Zone Inter University Basketball Tournament are presented in Table III.

Table – III: Mean, Standard Deviation and ‘F’ Ratio on Playing Ability among South Zone Inter University Women Basketball Players

Playing Ability	Source of Variance	Sum of Square	Df	Mean Square	Obtained ‘F’ Ratio
	Between	1809.896	3	603.299	25.354*
	Within	1039.583	44	23.627	

* Significant at .05 level of confidence.

(The table value required for significance with df 3 and 44 was 2.82)

Table III shows that the obtained “F” ratio value 25.354 which was greater than the required table value 2.82 with df 3 and 44 at .05 level of confidence.

The results of the study showed that there was a significant difference on playing ability among Hindustan University, University of Madras, SRM Institute of Science and Technology and Jain University basketball players.

Since, the ‘F’ ratio was found to be significant, the Scheffe’s test was used to find out the significant paired mean differences, if any. The results are presented in Table IV.

Table – IV: Scheffe’s Test for the Differences between Paired Means on Playing Ability among South Zone Inter University Women Basketball Players

Hindustan University	University of Madras	SRM Institute of Science and Technology	Jain University	Mean Differences	Confidence Interval Value
84.58	78.33	-	-	6.25*	1.29
84.58	-	70.01	-	14.57*	1.29
84.58	-	-	70.00	14.58*	1.29
-	78.33	70.01	-	8.32*	1.29
-	78.33	-	70.00	8.33*	1.29
-	-	70.01	70.00	0.01	1.29

*Significant at .05 level.

The table IV shows that the mean difference between Hindustan University and University of Madras basketball players, Hindustan University and SRM Institute of Science and Technology basketball players, Hindustan University and Jain University basketball players, University of Madras and SRM Institute of Science and Technology basketball players, University of Madras and Jain University basketball players 6.25, 14.57, 14.58, 8.32 and 8.33 respectively on playing ability which were greater than the required confidence interval value 1.29 for significance at .05 level of confidence.

The results of the study showed that there was a significant difference between Hindustan University and University of Madras basketball players, Hindustan University and SRM Institute of Science and Technology basketball players, Hindustan University and Jain University basketball players, University of Madras and SRM Institute of Science and Technology basketball players, University of Madras and Jain University basketball players on playing ability.

The mean values of Hindustan University, University of Madras, SRM Institute of Science and Technology and Jain University basketball players on playing ability were graphically represented in the Figure 1.

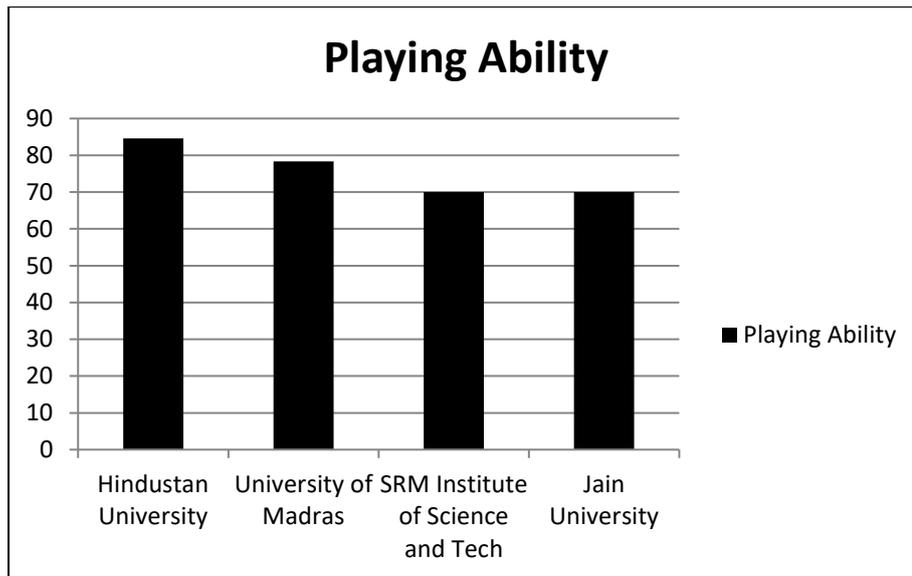


Fig. 1 : The Mean Values on Playing Ability among Hindustan University, University of Madras, SRM Institute of Science and Technology and Jain University Basketball Players

Discussion on Findings

The results of the study showed that there was a significant relationship between playing ability on selected anthropometrical and psychological variables such as height, weight, arm length, thigh circumference, calf circumference, sports competition anxiety and achievement motivation among South Zone Inter University women basketball players. The result of the study was supported by the study of Viswanathan et.al., (2011). Devaraju. K. (2014), Ersan Kara (2010), Esmaeilzadeh M. (2013), Sisic et. al., (2015).

V. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The results of the study showed that there was a significant relationship between playing ability on selected anthropometrical variables such as height, weight, arm length, thigh circumference and calf circumference among South Zone Inter University women basketball players.
2. The results of the study showed that there was a significant relationship between playing ability on selected psychological variable such as sports competition anxiety and achievement motivation among South Zone Inter University omen basketball players.

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