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**Dr. Yallappa M**  
M.P.Ed, K-SET, N.I.S, Ph.D.  
National kabaddi player, guest  
faculty, University college of  
physical Education, Bangalore  
university, Bangalore,  
Karnataka, India

**Corresponding Author:**  
**Dr. Yallappa M**  
M.P.Ed, K-SET, N.I.S, Ph.D.  
National kabaddi player, guest  
faculty, University college of  
physical Education, Bangalore  
university, Bangalore,  
Karnataka, India

## Relationship of selected physical and anthropometrical variables on the performance of karnataka state inter university male kabaddi players

**Dr. Yallappa M**

### Abstract

The present investigation is to find out the relationship with performance ability of kabaddi players of selected physical variables and Anthropometrical variables among 180 male university Kabaddi players of Karnataka state. The present study was carried out with the aim to find out the relationship between kabaddi performance and selected physical fitness variables as well as anthropometrical variables in relationship of university male kabaddi players. The physical fitness variables included speed, agility, power, flexibility, pull ups and endurance. The present were measured for Anthropometrical variables were height, weight, arm length, leg length and trunk length were measured by using the standardized tests and measurement. The performance ability was measured by using subjects rating of 10-point rating scale. The data were analyzed through multiple version analysis the following conclusion were drawn.

**Keywords:** Speed, agility, power, flexibility, pull ups and endurance. Height, weight arm length leg length trunk length

### Introduction

The origin of Kabaddi game lies in remote antiquity. In the pre independent India it was familiar in different regions. Never the less, different formats prevailed and were also called by different names such as Du-Du, Chadu Gudu, Kaun-Bada, Hututu etc. Amar, Gemini and Sanjeevini were the popular formats, and the latter version was accepted by vast majority of people in India by consensus. The game which was mostly popular in mofusil areas soon spread to urban areas too and become a part of curriculum in Physical Education colleges and is a scheduled competitions item in inter-school, inter-collegiate, inter-university, inter-district and inter-state competitions. In order to promote, control and regulate the game Kabaddi Federation of India was constituted. Since Kabaddi was familiar in India's neighboring countries, Asian Kabaddi Federation was formed. Innumerable State and National Level Kabaddi Tournaments are conducted each year, besides continental and sub-continental level tournaments. Kabaddi game was included in the official competition events of Asian games at Beijing in 1990. India has been reigning supreme in the Asian Games Kabaddi competition. This game is getting popular in Japan, Thailand, Singapore, Malaysia, China, Maldives, Bhutan, Srilanka, Pakistan, Nepal, Korea, and in the distant England and France. In India it has a mass following.

To the naive on lookers, the game looks as if it demands brutal strength. To the contrary, the game demands speedy movements, feinting, dodging, agility, arm-foot-eye coordination, cardiovascular endurance, flexibility and power besides characteristics body build and mental abilities. The Kabaddi game encompasses attacking (Raiding) and defensive (Catching) skills. Attacking skills, (Raiders skills) include touching the anti-raiders with hand with leg thrusts, and kicking, the defensive skills (skills of anti-raider) include ankle hold, knee hold, thigh hold, waist hold, wrist hold and a host of chain holds.

Kabaddi is a combative team game, played with absolutely no equipment, on a rectangular court, either out-doors or indoors with seven players on the ground in each side. Each side takes alternate chances at offence and defense. The aim of the game is to score points by raiding in the opponent's court and touching as many defense players as possible without getting caught on a single breath. During play, the players on the defensive side are called "Anties" while the player of the offence is called the "Raider". The attack in Kabaddi is known as a "Raid". The anties touched by the raider during the attack are declared 'out' if they do not succeed in catching the raider before he returns to home court.

These players can resume play only when their side scores points against the opposite side during their raiding turn or if the remaining players succeed in catching the opponent's raider. It requires skills, agility, and good lung capacity, muscular co-ordination, presence of mind, and quick responses, courage etcetera. For a single player to take on seven opponents is no mean task. It requires courage as well as ability to concentrate and anticipate the opponent's moves. In order to facilitate further growth of Kabaddi game, valid assessment procedures to comprehensively estimate the player's physical, anthropometrical abilities are needed.

### Statement of the Problem

The purpose of the present investigation is to find the relationship of selected Anthropometrical variables, with Performance in Kabaddi.

### Objective of the Study

- 1) To study the relationship between Performance of Kabaddi players and study Physical variables anthropometrical variables.
- 2) To study the impact of study Physical variables on Performance of Kabaddi players
- 3) To estimate the performance ability of Kabaddi players from the study variables.
- 4) To find the dominant predictors of performance ability of kabaddi players among the study variables.
- 5) To estimate the performance ability of kabaddi players from the selected anthropometrical variables height, trunk length, weight, arm length and leg length.

### Methodology

In the South-zone inter university Kabaddi championship held at to establish the nature of relationship between the performance in Kabaddi and the study variables, the following methodology was used.

**Selection of the Subjects:** The Subjects for the present study were male Kabaddi players of universities who had received regular training and participated in competitive Kabaddi game. The subjects were regular participants in the collegiate and university level Kabaddi championships.

They were drawn from different universities of Karnataka State who were rated as the best players by a panel of three expert coaches. The subjects were participants Kuvempu University, Shimoga (Karnataka) during the year 2015-16.

**Sample size of the Study:** The sample of the present study consisted of hundred (180) male Kabaddi players in the age group of 18 to 28 years.

**Selection of the variables for the Study:** After a thorough review of literature relevant to the game of Kabaddi found in books, journals, periodicals, and research articles besides detailed discussion with the experts and keeping in view feasibility of the study in terms of availability of equipment and the relevance of the variables to the present study, the following variables were selected.

**Total performance** of the selected subjects was rated by three experts subjectively on a ten-point rating scale. This was the dependent variable for this study.

**Independent Variables:** The various independent variables selected for the present study are listed below:

### 1) Physical fitness Variables

- 1) Speed
- 2) Agility
- 3) Power
- 4) Flexibility
- 5) Pull Ups
- 6) Endurance.

### 2) Anthropometrical variables

- 1) Height
- 2) Weight
- 3) Arm length
- 4) Leg length
- 5) Trunk length.

### Analysis

**Table 1:** Physical fitness variables

Physical Variables	Test used to Measure	Unit of Measurement
Speed	30mts run with standing start	In Secs
Agility	4 x 10 mts shuttle run	In Sec
Power-Leg explosive power	Standing broad jump	In Sec and Centimeters
Flexibility	Sit and Reach test	In Centimeters
Pull ups	Arm strength and endurance	By numbers
Endurance	1000 Metrs	By Mins

### Objectives

- To study the relationship between Performance of Kabaddi players and study Physical variables and anthropometrical variables
- To study the impact of study Physical variables on Performance of Kabaddi players

**Table 2:** Correlations

Correlations		Performance
Speed	Pearson Correlation	.094
	Sig. (2-tailed)	.212
	N	180
Agility	Pearson Correlation	.060
	Sig. (2-tailed)	.424
	N	180
Standing Broad jump	Pearson Correlation	.093
	Sig. (2-tailed)	.214
	N	180
Flexibility	Pearson Correlation	.066
	Sig. (2-tailed)	.381
	N	180
Pull Up	Pearson Correlation	.031
	Sig. (2-tailed)	.683
	N	180
Endurance	Pearson Correlation	.352**
	Sig. (2-tailed)	.000
	N	180

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

\*\*. Correlation is significant at the 0.01 level (2-tailed).

From the above table following inferences were made:

- The correlation between Performance and Speed was positive  $r = 0.009$  and  $P = 0.924 > 0.05$ , the test was not significant at 5% levels. That is, there was no

significant correlation between the Performance and the Speed of the Kabaddi players at 5% levels.

- The correlation between Performance and Agility was positive  $r = 0.032$  and  $P = 0.726 > 0.05$ , the test was not significant at 5% levels. That is, there was no significant correlation between the Performance and the Agility of the Kabaddi players at 5% levels.
- The correlation between Performance and Standing Broad Jump was positive  $r = 0.054$  and  $P = 0.558 > 0.05$ , the test was not significant at 5% levels. That is, there was no significant correlation between the Performance and the Standing Broad Jump of the Kabaddi players at 5% levels.
- The correlation between Performance and Flexibility was positive  $r = 0.137$  and  $P = 0.137 > 0.05$ , the test was not significant at 5% levels. That is, there was no significant correlation between the Performance and the Flexibility of the Kabaddi players at 5% levels.
- The correlation between Performance and Pull ups was positive  $r = 0.137$  and  $P = 0.137 > 0.05$ , the test was not significant at 5% levels. That is, there was no significant correlation between the Performance and the Pull ups of the Kabaddi players at 5% levels.
- The correlation between Performance and Endurance was positive  $r = 0.460$  and  $P = 0.00 < 0.05$ , the test was significant at 5% levels. That is, there exists significant correlation between the Performance and the Endurance of the Kabaddi players at 5% levels.

**a. Dependent Variable: Performance**

The estimated regression equation of Performance on the Physical variables was given by

$$\text{Performance} = 24.55 + 0.059 (\text{Endurance})$$

And the above regression equation was significant as indicated in ANOVA table with  $P = 0.00 < 0.05$  at 5% level of significance.

Hence, one unit change in Endurance indicates 0.059 unit change in Performance.

- There exists significant correlation between the Performance and the Endurance of the Kabaddi players
- The regression equation of Performance and the physical variables were statistically significant with one unit change in Endurance indicates 0.059 unit change in Performance.

**Table 2:** Anthropometrical Variables in relation to performance in kabaddi

Anthropometrical variables	Equipment used to Measure	Unit of Measurement
Height	Stadiometer	Centimeters
Weight	Weighing machine	In kilograms
Arm Length	Measuring tape	Centimeters
Leg length	Measuring tape	Centimeters
Trunk Length	Measuring Tape	Centimeters

**Table 3:** Descriptive Statistics

Anthropometrical variables	N	Minimum	Maximum	Mean	Std. Deviation
Height	180	154.0	189.0	173.111	5.8280
Weight	180	54.00	81.00	69.3617	7.29906
Arm length	180	60.0	86.0	75.039	4.1121
Leg length	180	48.00	175.00	105.7278	15.83851
Trunk length	180	46.00	58.00	52.1833	2.60527
Valid N (list wise)	180				

From the above table following details were given:

- The average Height of the players was 173.11 cms with standard deviation 5.83.
- The average Weight of the players was 69.36 kgs with standard deviation 7.30.
- The average Arm length of the players was 75.04 cms with standard deviation 4.11.
- The average Leg length of the players was 105.73 cms with standard deviation 15.84.
- The average Leg length of the players was 105.73 cms with standard deviation 15.84.
- The average Trunk length of the players was 52.18 cms with standard deviation 2.61.

**Anthropometrical variables:**

Correlation analysis was used and the computations made were tabulated in the

**Table 4:** Correlation

	Performance	R
Height	Pearson Correlation	.208**
	Sig. (2-tailed)	.005
	N	180
Weight	Pearson Correlation	.216**
	Sig. (2-tailed)	.004
	N	180
Arm	Pearson Correlation	.132
	Sig. (2-tailed)	.078
	N	180
Leg	Pearson Correlation	-.017
	Sig. (2-tailed)	.822
	N	180
Trunk	Pearson Correlation	.160*
	Sig. (2-tailed)	.032
	N	180

\*\* . Correlation is significant at the 0.01 level (2-tailed).

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

- The correlation between performance and height was positive,  $r = 0.208$  with  $P = 0.005 < 0.05$ , the test was significant at 5% levels, that is, there exists significant positive correlation between performance and height of Kabaddi players.
- The correlation between performance and weight was positive,  $r = 0.216$  with  $P = 0.005 < 0.05$ , the test was significant at 5% levels, that is, there exists significant positive correlation between performance and weight of Kabaddi players.
- The correlation between performance and arm length was positive,  $r = 0.132$  with  $P = 0.078 > 0.05$ , the test was not significant at 5% levels, that is, there was no significant positive correlation between performance and weight of Kabaddi players.
- The correlation between performance and leg length was negative,  $r = -0.017$  with  $P = 0.822 > 0.05$ , the test was not significant at 5% levels, that is, there was no significant negative correlation between performance and leg length of Kabaddi players.
- The correlation between performance and Trunk length was positive,  $r = 0.160$  with  $P = 0.032 < 0.05$ , the test was significant at 5% levels, that is, there exists significant positive correlation between performance and trunk length of Kabaddi players.

The estimated regression equation of Performance on the Anthropometrical variables was given by

Performance = -2.333-.013 (Height) +0.231 (Weight) +0.360 (Arm length) + 0.039 (Trunk length) and the above regression equation was significant as indicated in ANOVA table with  $P = 0.00 < 0.05$  at 5% level of significance.

Hence

- One unit change in Height indicates 0.013 unit change in Performance.
- One unit change in Weight indicates 0.231 unit change in Performance.
- One unit change in Arm length indicates 0.360 unit change in Performance.
- One unit change in Trunk length indicates 0.039 unit change in Performance.

### Findings

- There exists significant correlation between the Performance and the Height of the Kabaddi players
- There exists significant correlation between the Performance and the Weight of the Kabaddi players
- There exists significant correlation between the Performance and the Arm length of the Kabaddi players
- There was no significant correlation between the Performance and the Leg length of the Kabaddi players
- There exists significant correlation between the Performance and the Endurance of the Kabaddi players
- The regression equation of Performance and the Anthropometrical variables were statistically significant with One unit change in Height indicates 0.013 unit change in Performance; One unit change in Weight indicates 0.231 unit change in Performance; One unit change in Arm length indicates 0.360 unit change in Performance and One unit change in Trunk length indicates 0.039 unit change in Performance.

### Results and Discussion

- With the emphasis made by the investigator in the of Introduction about eleven variables under study were essential qualities of good performance in Kabaddi. The multiple regression analysis was conducted and the following regression equation of performance in Kabaddi on the eleven variables under the study were obtained.
- With the findings narrated earlier the investigator found that not all eleven variables were significantly correlated with the performance in Kabaddi, step wise regression analysis was conducted for performance in Kabaddi on two classified categories-physical variables, anthropometrical variables the study variables separately, the analysis have been presented earlier.
- Considering the physical variables only as independent variables in the step wise regression analysis, leg explosive power, speed and cardio vascular endurance would act as predictors for performance in kabaddi. The other three variables agility, flexibility and arm strength endurance were found to be not significantly associated with the performance in Kabaddi
- Considering the anthropometrical variables only as independent variables in the step wise regression analysis Height, Weight, Arm length, Trunk length, would act as predictors for performance in kabaddi. The other leg length variable was found to be not

significantly associated with the performance in kabaddi

- In the light of discussion and the step wise regression analysis in respect of performance in Kabaddi and the eight study variables, the investigator has arrived at the following conclusions.
- The estimated multivariate stepwise regression of Performance on the study variables was given by
- Performance = -28.967 +5.242 (Speed) +6.491 (Standing broad jump) +0.056 (Endurance) +0.152 (Weight)

That is, for one unit change in Speed score indicates 5.242 unit change in Performance; for

### Conclusions

Among the selected six physical variables only speed, leg explosive power and cardiovascular endurance were found to be significant correlation in relation to performance in the Kabaddi and flexibility, were found to be not significantly correlated to performance in Kabaddi. Among the selected five anthropometric variables only weight, were found to be significant correlated to performance in the Kabaddi and height, arm length, leg length, were found partially significant correlated in relation to performance in kabaddi and trunk length, were found to be not significantly correlated to performance in Kabaddi.

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