Asian Journal of Information Technology 11 (4): 131-134, 2012
ISSN: 1682-3915

Prediction of Kabaddi Playing Ability from Selected Anthropometrical and Physical Variables among College Level Players

[1]K. Devaraju and [2]R. Kalidasan
[1]Department of Physical Education,
Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, India
[2]Department of Physical Education, Bharathidasan University, Thiruchirappalli, India

Abstract: The purpose of the study was to predict the Kabaddi playing ability from selected anthropometrical and physical variables among college level players. One hundred and fourty four 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 3 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. Physical fitness components were measured by the following tests. Speed were assessed by 50 m dash, flexibility assessed by Sit and Reach test, leg explosive strength assessed by Standing broad jump, Muscular power assessed by modified sit-ups and muscular endurance assessed by 2.4 km run. The playing ability which was taken as the performance factor was subjectively assessed by three qualified Kabaddi coaches. All testing was done 2 days 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 variables and Kabaddi playing ability were computed by using Pearson' product-moment correlation coefficients. All selected anthropometrical and physical variables that statistically correlated with performance were used to form respective linear predictive models (step-wise argument selection). The results revealed that an Inter-relationship exists significantly between the anthropometrical, physical and performance variables among male inter-collegiate Kabaddi players. The results also revealed that speed, agility, weight and flexibility become the common characteristics which can predict the playing ability in Kabaddi players.

Key words: Kabaddi, flexibility, agility, linear predictive models, collegiate competition

INTRODUCTION

In India, kabadi is major sports which is played all over the India. This game is also getting a good status in Asian sports. This game is classified as a team game. Sport is a medium through which a player develops both physical and mental abilities and finally it results into a Conscious Method of doing whatever one does most effectively whereas in other arts researchers utilize mental and physical abilities partially. Kabbadi is basically an Indian game which requires both skill and power. Kabaddi combines the characteristics of wrestling and rugby. Kabaddi is played in more than sixty five countries, especially Asian countries. 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 (Ross *et al*., 1980). This interface is examined through the measurement and analysis of age, body size, shape, proportion, composition and maturation as they relate to gross body function. Previous reports have shown that body structure and morphological characteristics are important determinants of performance

Corresponding Author: K. Devaraju, Department of Physical Education, Dr. Sivanthi Aditanar College of Engineering, Tiruchendur, India

in many sports and certain physical impressions such as body composition (body fat, body mass and muscle mass) and physique (somatotype) can significantly influence athletic performance (Carter, 1970; Duquet and Carter, 2001).

In performance and high performance sport, a great importance is given to the physical condition. It is in fact the preoccupation for the adaptation of the sportsman's body to growing physical and mental efforts to which all the parts of the human body participate. The contemporary Kabaddi game, characterised by high intensity motor activities, places upon players a wide spectrum of requirements on all their capabilities. One can hardly single out any ability or a characteristic which is not engaged in the performance of Kabaddi players.

Kabaddi is a strength game. Without endurance the player cannot perform well in the same time the player's need all the characteristics, i.e., speed, agility, flexibility and endurance etceteras. Now a days 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 Kabaddi. The purpose of the study was to predict the Kabaddi playing ability from selected anthropometrical and physical variables among college level players.

MATERIALS AND METHODS

Selection of subjects: One hundred and fourty four 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 3 years in Kabaddi and only those who represented their respective college teams were taken as subjects.

Selection of variables and tests: 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. Physical fitness components were measured by the following tests. Speed were assessed by 50 m dash, flexibility assessed by Sit and Reach test, leg explosive strength assessed by Standing broad jump, muscular power assessed by modified sit-ups and muscular endurance assessed by 2.4 km run. The playing ability which was taken as the performance factor was subjectively assessed by three qualified Kabaddi coaches.

Statistical techniques: All testing was done 2 days 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 variables and Kabaddi playing ability were computed by using Pearson' product-moment correlation coefficients. All selected anthropometrical and physical variables that statistically correlated with performance were used to form respective linear predictive models (step-wise argument selection).

RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics Mean and Standard deviation of anthropometric characteristics, physical variables and playing ability of college level Kabaddi players. The present study attempted to link the coaches rating as measure of playing ability with the anthropometric characteristics, physical variables of college level Kabaddi players, correlation analysis was made.

Table 2 shows that there was a correlation exists between the playing ability versus speed (r = 0.61) and Leg explosive strength (r = 0.79) rest of other physical variables showed moderate correlation with the playing ability. Rest of other anthropometrical characteristics shows low correlation with the playing ability of college level Kabaddi players. Next by means of stepwise selection, the best models of linear regression for predicting the playing ability of college level Kabaddi players was analysed. In each model, only the variable that achieved significance with the cut-off criteria set at probability of F less than equal to or <0.001, 0.01 and 0.05 level was listed. The predictor variables and their importance in predicting the playing ability of Kabaddi players are shown in the Table 3.

$$\text{Playing ability} = 2.411 + 2.460\ (X_7) + 0.032\ (X_8) - 0.473\ (X_5) - 0.055\ (X_3) + 0.053\ (X_4)$$

Table 1: Descriptive statistics of college level players

Variables	Mean (N = 144)	SD
Playing ability	7.7569	±1.03
Height	170.5764	±6.36
Weight	62.5278	±7.62
Leg length	98.9167	±5.58
Arm length	73.0347	±4.08
Speed	6.3062	±0.54
Flexibility	18.2986	±2.98
Leg explosive strength	1.8080	±0.28
Muscular power	49.9028	±7.39
Muscular endurance	10.7201	±0.61

Table 2: Inter-correlation of selected anthropometrical, physical variables with the playing ability of college level Kabaddi players

Variables	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
C.R	0.098	0.175	0.103	0.030	0.612	0.214	0.797	0.204	0.142
X_1	-	0.403	0.861	0.795	0.053	0.297	0.041	0.001	0.126
X_2	-	-	0.232	0.151	0.051	0.310	0.194	0.022	0.012
X_3	-	-	-	0.782	0.044	0.291	0.041	0.027	0.108
X_4	-	-	-	-	0.035	0.244	0.108	0.036	0.115
X_5	-	-	-	-	-	0.091	0.561	0.060	0.080
X_6	-	-	-	-	-	-	0.327	0.038	0.034
X_7	-	-	-	-	-	-	-	0.063	0.038
X_8	-	-	-	-	-	-	-	-	0.082

C.R: Playing ability; X_1: Height; X_2: Weight; X_3: Leg Length; X_4: Arm length; X_5: Speed; X_6: Flexibility; X_7: Leg explosive strength; X_8: Muscular power; X_9: Muscular endurance

Table: 3: Regression analysis of predictive equation in college level Kabaddi players

				Unstandardized coefficients		
Models	Variables	R (R^2 change)	R^2 (F change)	B	SE	Standardized coefficients (Beta)
1	Constant			2.411	0.344	-
	Leg explosive strength	0.797 (a)	0.636	2.957	0.188	0.797
2	Constant			0.526	0.463	-
	Leg explosive strength			3.016	0.171	0.813
	Muscular power	0.837 (b)	0.700	0.036	0.006	0.255
3	Constant			3.964	0.988	-
	Leg explosive strength			2.580	0.198	0.696
	Muscular power			0.033	0.006	0.235
	Speed	0.854 (c)	0.730	-0.398	0.102	-0.208
4	Constant			6.485	1.249	-
	Leg explosive strength			2.589	0.192	0.698
	Muscular power			0.032	0.006	0.232
	Speed			-0.407	0.099	-0.212
	Leg length	0.865 (d)	0.748	-0.025	0.008	-0.134
5	Constant			6.269	1.215	-
	Leg explosive strength			2.460	0.192	0.663
	Muscular power			0.032	0.006	0.230
	Speed			-0.473	0.099	-0.247
	Leg length			-0.055	0.013	-0.297
	Arm length	0.874 (e)	0.763	0.053	0.017	0.208

n = 144: R^2 = 0.797 for step 1: ΔR^2 = .763 for final step) Significant at *p<0.5

Table 3 shows the Regression Analysis of Predictive Equation in college level Kabaddi players in the samples. Among the anthropometrical, physical variables, leg explosive strength scores accounted for 79% in the first model of the performance ability. Muscular power, speed, leg length and arm length subsequently added significantly (0.01 and 0.05 levels) to the prediction of the playing ability in college level Kabaddi players up to the final model. The R^2 value for the combination of leg explosive strength, muscular power, speed, leg length and arm length on playing ability was 0.874 (87%) with the R^2 change (ΔR^2) 0.763 for the final model.

Many team sports include complex human movement which can be observed at different levels of detail. This is especially true for team sports (Soccer, Handball and Basketball). Kabaddi is one of the most popular team based sports and has been played by both men and women throughout the world. Kabaddi is basically an outdoor team game, played in the tropical countries of Asia. The excitement and thrill provided by the game has made it very popular and Kabaddi is rightly called the game of the masses since, spectators totally involve themselves and give the players a great deal of encouragement.

Performance in any sports activity depends to a large extent on physical fitness. Sports trainers concentrate on improving the physical fitness and motor abilities of a player, i.e., speed, strength, endurance and flexibility. Improving the physical fitness of a player is also called conditioning. A sound conditioning programme forms the most important part of training any sports person. Conditioning or physical fitness is categorized into general and specific fitness. General fitness refers to the common qualities required for any sports person irrespective of the sport, i.e., motor qualities such as strength, endurance, flexibility and coordination ability. Every sport demands motor abilities at various levels above the average. Specific fitness is achieved when a player acquires the required motor ability at the intensified level for the particular sport. For example, specific fitness

in kabaddi is with reference to strength, speed and co-ordination. These findings are in accordance with the Verma *et al*. (2011).

Kabaddi favors body development with a muscular strength stamina and endurance because of its special feature, Cant holding, enriches cardiovascular endurance and resistance. Fine flexibility and agility is developed as one needs to move faster in such a small area of 20'-30' (10-12 Mts). Player's eyes and body movement become quicker. On the other hand in physical skills speed, power (strength), endurance, flexibility, swift action and proper coordination between hand eyes and limbs. If your body is flexible then only you can kick, swiral grapple with ankle legs and things. Here more than speed acceleration is paramount; strong leg muscles give more punch to the player. Agility and stamina are also very essentially. These findings are in accordance with the Jadhav (2011).

CONCLUSION

The results obtained in the present study illustrated the formation of anthropometrical and physical variables optimum predictive equation models in male Kabaddi players. From the analysis of data:

- The results revealed that there was a correlation exists between the playing ability versus speed, leg explosive strength, flexibility and muscular power
- The results also revealed that leg explosive strength, muscular power, speed, leg length and arm length becomes the common characteristics which can predict the playing ability in Kabaddi players

REFERENCES

Carter, J.E., 1970. The somatotypes of athletes: A review. Hum. Biol., 42: 535-569.

Duquet, W. and J.E. Carter, 2001. Somatotyping. In: Kinanthropometry and Exercise Physiology Laboratory Manual 1: Anthropometry, Eston, R. and T. Reilly (Eds.). Routledge, London, pp: 47-64.

Jadhav, K.M., 2011. Role of Yoga in Kabaddi sport. Golden Res. Thoughts, 1: 1-4.

Ross, W.D., D.T. Drinkwater, D.A. Bailey, G.R. Marshall and R.M. Leahy, 1980. Kinanthropometry, Traditions and New Perspective. In: Kinanthropometry II. International Series on Sports Science, Ostyn, M., G. Beunen and J. Simons (Eds.), Vol. 9, University Park Press, Baltimore, pp: 3-27.

Verma, A., D. Rana and A. Singh, 2011. To develop physical profile of Kabaddi Players: The descriptive study. Indian J. Movement Educ. Exerc. Sci., 1: 1-5.