Nat. Volatiles & Essent. Oils, 2021; 8(5): 10067 - 10074

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Natural Volatiles & Essential Oils

Development of Regression Equation to Predict Kabaddi Senior Boys' Performance with the help of Digit Ratio, Stress-Vulnerability and Selected Anthropometric Variables.

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Abstract

The present study developed regression equation to predict Kabaddi Senior boys' performance with the help of digit ratio, stress-vulnerability and selected anthropometric variables. Fifty senior level male kabaddi players were selected randomly as the subjects for the study from various state of India. The data had been collected by method of the tests for the chosen variables. All the tests had been conducted at National Level Senior Kabaddi boys. To find out correlation between Independent Variables (Finger Ratio (2D:4D), Anthropometric Variable and stress vulnerability) and Dependent Variable (Kabaddi performance), partial correlation was used. The three models of multiple regressions contribute the following conclusions.

In model 1, R of 0.960 is the relationship between independent variables (2D:4D) and dependent variable (Kabaddi Performance). Adjusted R square of 0.92 justifies that 92% of Kabaddi Performance in explained by Digit Ratio.

In model 2, R of 0.968 is the relationship between independent variables (2D:4D) and Calf Girth) and dependent variable (Kabaddi Performance). Adjusted R square of .93 justifies that 93% of Kabaddi Performance in explained by Digit Ratio and calf Girth.

In model 3, R of 0.972 is the relationship between independent variables (Digit Ratio, Calf Girth and Height) and dependent variable (Kabaddi Performance).

Keywords: *Anthropometry variables, Finger Ratio (2D:4D), stress vulnerability, regression equation and Kabaddi Performance*.

1. Introduction:

Evidence of physical activities like games, sports, exercise, and dance etcetera is found in anthropology rudiments, art and literature from the earliest of times to foremost eras. These events were easy and entertaining hobbies but still were impulsive contests or competitions. People in a lot of regions and in various periods seem to own prearranged events with diverse roles or finishes in sight, relying upon whatever sensed because of the utmost vital desires. As evolution progressed, they were accustomed to fulfilling the socio-nationalistic desire besides a lot of new necessities to fulfil personal and communal advancement. These physical events in varied practices are employed through human societies throughout the planet from primitive periods to the foremost eras for existence, competition, prize, fitness, personal and common development etc.

Almost all the countries nowadays are taking earnest concern in sports and games due to the multifarious assistance they create towards personal and public development [1-2]. At present, day sports and games have taken diverse procedures and they fulfill a major part in the life of masses. Sports, as well as games, are supposed to be a product of the culture of every civilization. Sports, as well as games, replicate the cultural values of a civilization. There's an awful study mutual inter-relationship between sports and the culture, as they effectively impact one another [3]. Games

and sports became an elementary culture in each fashionable community wherever completely diverse individuals take part in them with varied functions which were visible. Physical activities within the primitive societies were primarily targeted on survival, defiance of the community, competitions, rewards, recreation, fitness, and health. Some of those physical activities that received people acclaim were remodelled as sports and games in the course of our time. Several folk in every society and culture, therefore, are collaborating in various sports and games.

There are five common terms that ought to be thought about at this stage; Talent, Talent Detection, Talent Identification (TID), Talent choice (TS) and Talent Development (TD). Talent may be a marked innate ability outlined as an inventive accomplishment, talent or a capability of superior quality. Talent in sport is outlined as AN individual's special ability that's higher than average for specific functions. Physical abilities are also useful, communicatory or athletic [4].

Experts aforementioned god blesses one and all within the world with a minimum of one talent if less. Distinguishing talent at a young age in an exceedingly is very useful because the kid is plastered for improvement and excellence from the initial days. Understanding the abilities and interests of your child and recognizing the field or space of his/her excellence, supplies a mixture feeling of pleasure and pride for any parent. Once the world of perspective for a kind is known, deliberate initiatives can be taken to cultivate and nurture that endowment by oldsters, teachers, relatives, and alternative adults. However, the most task at hand first off lies in recognizing a gifted kid. The additional the amount of prospects a toddler gets and also the additional the number of various events he participates in, the better it'll be to spot his abilities and gifts.

1.1 Objectives of the Study

The underlying statements reveal the objectives of the present investigation;

1. To determine and find out the joint contribution of finger ratio, anthropometry and stress vulnerability in performance level of Senior Kabaddi Boys.
2. To predict the performance level of Senior Kabaddi Boys based on finger ratio, anthropometry and stress vulnerability.

1.2 Hypotheses

On the basis of the recent literature and understanding of the scholar, following hypothesis arranged;

H1: There will be significant relationship between digit ratio and performance level of Senior Kabaddi boys.

H2: There will be significant relationship between anthropometry and performance of Senior Kabaddi boys.

H3: There will be significant relationship between stress vulnerability and performance of Senior Kabaddi boys.

H4: There might be significant relationship of Senior Kabaddi boys' performance with the digit ratio, anthropometry and stress vulnerability.

2. Procedure and Methodology

Data for the current study is collected by methodology of the tests for the chosen variables. All the tests are conducted at National Level Tournaments for Senior Kabaddi boys. Investigator of this study visited the venues of Senior National tournaments along with three experts of this field.

The data relating to Kabaddi performance of players at different level is taken with the help of Kabaddi Federation of India.

3. Results and Discussions

The statistical investigation of composed information in the form of data on physical, physiological and psychological parameters on fifty senior boys from Kabaddi belonging to schools, colleges and universities has been discussed in this section. The data connect to numerous physical, physiological and psychological parameters has been examined by using the descriptive statistics i.e. mean, standard deviation, standard error, median, mode, sample variance, kurtosis, skewness and range. Further, regression equation was developed on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability.

3.1 Statistical Findings

The conclusions concerning to descriptive statistics and correlation technique for the various physical, physiological and psychological variables of two hundred sports persons have been tabulated in table No. 1.1 to 1.4.

Table 1.1 Descriptive statistics of kabaddi performance of Senior Kabaddi boys

	N	Mean		Std. Dev	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Height	50	167.3200	.84004	5.93997	-.183	.337	-.924	.662
Leg Length	50	88.4600	.72799	5.14766	.023	.337	.519	.662
Calf Girth	50	32.6600	.44042	3.11422	1.462	.337	1.893	.662
Thigh Girth	50	46.0400	.44900	3.17490	.747	.337	.836	.662
Waist Circum	50	81.3400	.40468	2.86150	.045	.337	-.786	.662
Digit Ratio	50	1.0054	.00562	.03975	-.040	.337	-1.386	.662
Body Ratio	50	1.8983	.01555	.10994	.360	.337	.532	.662
Stress Vulnerability	50	40.8600	1.29174	9.13395	-.518	.337	-.575	.662
Performance	50	5.8600	0.20605	1.45700	-.036	.337	-.706	.662

Table- 1.1. revealed that the descriptive statistics of fifty subjects in Anthropometric, Digit Ratio, Stress Vulnerability and Kabaddi Performance with respect to Kabaddi boys.

1. In Height, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard error of kurtosis are found 167.32, 5.93, -.18 and -.92 respectively.
2. In Leg Length, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 88.46, 5.14, .02 and .51 respectively.
3. In Calf Girth, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 32.66, 3.11, 1.46 and 1.89 respectively.
4. In Thigh Girth, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 46.04, 3.17, .74 and .83 respectively.
5. In Waist Circumference, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 81.34, 2.86, .04 and -.78 respectively.
6. In Digit Ratio, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 1.0054, .04, -.040 and -1.386 respectively.
7. In Body Ratio, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 1.8983, .10884, .360 and .532 respectively.
8. In Stress Vulnerability, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 40.860, 9.13, -.518 and -.575 respectively.
9. In Performance, observed mean (statistics), standard deviation, Skewness (statistics), standard error of Skewness, kurtosis (statistics), standard of kurtosis are found 5.8600, 1.46, -.036 and -.706 respectively.

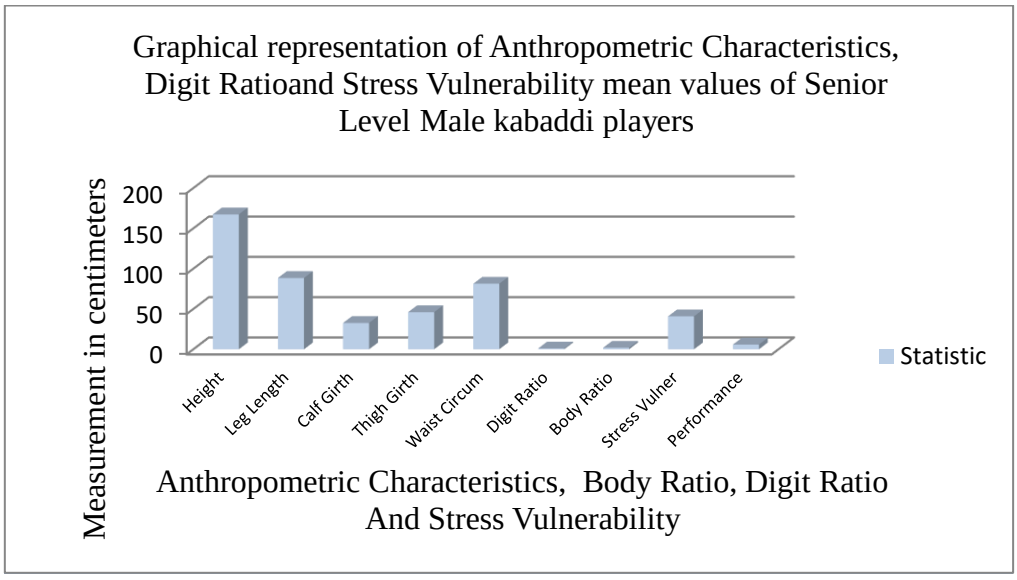

Figure 1: Graphical representation of Anthropometric Characteristics, Digit Ratio and Stress Vulnerability mean values of senior Kabaddi boys.

Table 1.2 Model Summary related to estimating kabaddi Performance of senior kabaddi boys on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.960[a]	.923	.921	.40974	1.319
2	.968[b]	.936	.934	.37504	
3	.972[c]	.945	.941	.35335	
a. Predictors: (Constant), Digit Ratio					
b. Predictors: (Constant), Digit Ratio, Calf Girth					
c. Predictors: (Constant), Digit Ratio, Calf Girth, Height					
d. Dependent Variable: Performance					

Table- 1.2 shows the model summary for estimating kabaddi Performance on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability in senior level male kabaddi player. Three models were established by multiple regression analysis.

I. In model 1, R of .960 is the relationship between independent variables (Digit Ratio) and dependent variable (Kabaddi Performance). Adjusted R square of .92 justify that 92% of Kabaddi Performance in explained by Digit Ratio.
II. In model 2, R of .968 is the relationship between independent variables (Digit Ratio and Calf Girth) and dependent variable (Kabaddi Performance). Adjusted R square of .93 justify that 93% of Kabaddi Performance in explained by Digit Ratio and calf Girth.
III. In model 3, R of .972 is the relationship between independent variables (Digit Ratio, Calf Girth and Height) and dependent variable (Kabaddi Performance). Adjusted R square of .94 justify that 94% of Kabaddi Performance in explained by Digit Ratio, Calf Girth and Height.

Table 1.3: ANOVA Table for estimating kabaddi Performance on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability in senior kabaddi boys

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95.961	1	95.961	571.582	.000[a]
	Residual	8.059	48	.168		
	Total	104.020	49			

2	Regression	97.409	2	48.705	346.260	.000[b]
	Residual	6.611	47	.141		
	Total	104.020	49			
3	Regression	98.277	3	32.759	262.370	.000[c]
	Residual	5.743	46	.125		
	Total	104.020	49			
a. Predictors: (Constant), Digit Ratio						
b. Predictors: (Constant), Digit Ratio, Calf Girth						
c. Predictors: (Constant), Digit Ratio, Calf Girth, Height						
d. Dependent Variable: Performance						

Table- 1.3 of ANOVA is related to the utility of three established models.

I. In this model, F. Value of 571.582 is significant at .05 level, this model is found effective is estimating Kabaddi Performance on the basis of Digit Ratio.
II. In this model, F. Value of 346.260 is significant at .05 level, this model is found effective is estimating Kabaddi Performance on the basis of Digit Ratio and Calf Girth.
III. In this model, F. Value of 262.3700 is significant at .05 level, this model is found effective is estimating Kabaddi Performance on the basis of Digit Ratio, Calf Girth and Height.

Table 1.4: Coefficients of Regression Model for estimating Kabaddi Performance on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability in senior Kabaddi boys

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	-29.531	1.481		-19.934	.000
	Digit Ratio	35.202	1.472	.960	23.908	.000
2	(Constant)	-28.151	1.423		-19.789	.000
	Digit Ratio	31.458	1.783	.858	17.645	.000
	Calf Girth	.073	.023	.156	3.208	.002
3	(Constant)	-12.152	6.216		-1.955	.057
	Digit Ratio	24.828	3.025	.677	8.209	.000
	Calf Girth	.061	.022	.131	2.803	.007
	Height	-.054	.020	-.218	-2.636	.011
a. Dependent Variable: Performance						

Table- 1.4 shows the coefficients of regression model for estimating kabaddi Performance on the basis of Anthropometric variables, Digit Ratio and Stress Vulnerability senior kabaddi boys**.** On The basis of table 1.4 established models are:

Model 1: Performance = -29.531 + 35.202 × Digit Ratio
Model 2: Performance = -28.151 + 31.458 * Digit Ratio + .073 * Calf Girth
Model 3: Performance = -12.152 + 24.828 * Digit Ratio + .061 * Calf Girth + -.054 * Height

Tariq Qudsia [5] conducted a study on the topic “Impact of stress vulnerability on anxiety and depression”. The prediction scale of vulnerability to stress has been governed to attain conclusive remarks on the dissimilarity in stress vulnerability among persons experiencing a higher degree of nervousness dejection. The values have been estimated so as to observe the mean scores in patients suffering from the state of anxiety and depression and the same test has been conducted to conclude the same effect between the different genders. The studies by various researchers also point out the necessity of frame the impact of stress vulnerability in personality development [6-7] The present study was clearly indicated that stress vulnerability was showed on anxiety and depression. Since there is a close association of digit ratio, vulnerability to stress and anxiety and designated anthropometric parameters with the kho-kho performance, the regression equation established in this study may be generalized to estimate kho-kho performance on the basis of selected anthropometric variables, digit ratio and stress vulnerability.

4. Conclusion

For estimating kabaddi Performance on the basis of Anthropometric variables, Digit Ratio, Body Ratio and Stress Vulnerability senior level male kabaddi players and established model 1 is Performance = -29.531 + 35.202 * Digit Ratio, model 2 is Performance =-28.151 + 31.458 * Digit Ratio + .073 * Calf Girth and model 3 is Performance = -12.152 + 24.828 * Digit Ratio + .061 * Calf Girth + -.054 * Height.

The relationship between Height and leg length (R= .71 p= .00), Height and calf girth (R= -.65 p= .00), Height and thigh girth (R= -.67 p= .00), Height and digit ratio (R= -.90 p= .00), Height and body ratio (R= .69 p= .00), Height and stress vulnerability (R= -.39 p= .00); leg length and calf girth (R= -.61 p= .00), leg length and thigh girth (R= -.66 p= .00), leg length and digit ratio (R= -.70 p= .00), leg length and body ratio (R= .62 p= .00); calf girth and thigh girth (R= .57 p= .00), calf girth and digit ratio (R= .65 p= .00), calf girth and body ratio (R= -.56 p= .00); thigh girth and digit ratio (R= .70 p= .00), thigh girth and body ratio (R= -.69 p= .00); digit ratio and body ratio (R= -.68 p= .00), digit ratio and stress vulnerability (R= .48 p= .00); & body ratio and stress vulnerability (R= -.34 p= .01) were found positive correlation at .05 level of significance.

On the other hand, height and waist circumference, height and sitting height; leg length and waist circumference; calf girth and waist circumference, calf girth and sitting height, calf girth and stress vulnerability; thigh girth and waist circumference, thigh girth and stress vulnerability; waist circumference and sitting height, waist circumference and stress vulnerability; digit ratio and stress vulnerability & sitting height and stress vulnerability were found no relationship in senior kabaddi boys.

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