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REGRESSION MODEL FOR PREDICTION OF BASKETBALL PLAYERS PERFORMANCE ON BASIS OF DIGIT RATIO

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ABSTRACT

The objective of present study was to investigate the relationship of digit ratio with performance of elite basketball players. To achieve the purpose of the study 30 elite men basketball players were selected purposely from different training centers of Indian Basketball team. The age of the selected players were ranged from 12 to 25 years. The Left and Right hand Digit Ratio was selected as predictor variables to estimate the performance of basketball players. Performance was measured through the match analysis of selected players from video recording. To assess the performance of players a panel of three experts was constituted, they assessed the performance on the basis of 30 point rating scale. Digital Vernier Caliper was used to measure the Digit Ratio. Finding of the study suggested that there were siginificant correlation of left and right hand digit ratio with performance of elite Basketball Players, whereas, the model suggest that only left hand digit ratio is significantly contributing to performance of elite basketball players.

Keywords: 2D, 4D, Left hand 2D: 4D and Right hand 2D: 4D.

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INTRODUCTION

Evidence of relationships between digit ratio and competitive sports is driven from the association between low digit ratio and marked sudden surge of testosterone after competition. It has been known that low Dr-l is related to high performance in elite rugby union players. And, low Dr-l is also a predictive factor of high sudden surge of testosterone. And, low digit ratio is also linked to high levels of performance in females. These correlations may in part explain the link between low digit ratio and competitive sports **(Ribeiro et al., 2016).**

In another study on Australian Basketball Players **Freak et al. 2016** concluded that there were significant differences between competitive standards for the left 2D:4D following Bonferroni correction, but not for the right 2D:4D, with basketballers who achieved higher competitive standards tending to have lower left 2D:4Ds. No important correlations between 2D:4D and basketball game-related statistics were found, with correlations typically negligible. So finding of this study also indicate that there is no enough evidence that suggest that 2D:4D is related with basketball performance. But in another study **Klapprodt et al. 2018** in their study on professional and semi-professional male basketball players has revealed that 2D:4D was a weak to moderate negative correlate of points scored and assists to turnovers ratio, indicating that males with lower 2D:4D were generally better offensively as they recorded more points and assists relative to turnovers. The difference in mean 2D:4D between starting and reserve players was negligible and concluded that 2D:4D is favorably correlated with open skill sports performance, as evidenced by the better offensive statistics of male basketball players with lower 2D:4Ds whereas, results probably reflect the organizational benefits of prenatal testosterone and indicate that 2D:4D may be a useful complement to traditional physical, physiological, skill, and behavioral predictors of basketball success.

It seems there is lot of contradictory results in terms of 2D:4D ratios and its relation with sports performance. Probably the present study may provide some insight in this regard that weather digit ratio has any significant relationship with level of participation in basketball or not

Methodology: The objective of present study was to investigate the relationship of digit ratio with performance of elite basketball players. For the purpose of present study 30 elite men basketball players were selected purposely from different parts of the country. The age of subjects was ranged between 12 to 25 years. Further left hand and right hand digit ratio was selected as predictor variables for the performance of basketball players. Performance was measured through match analysis with the help of video on selected players. To assess the performance of players a panel of three experts was constituted, they assessed the performance on the basis of 30 point rating scale. Digital Vernior Caliper was used to measure the digit ratio.

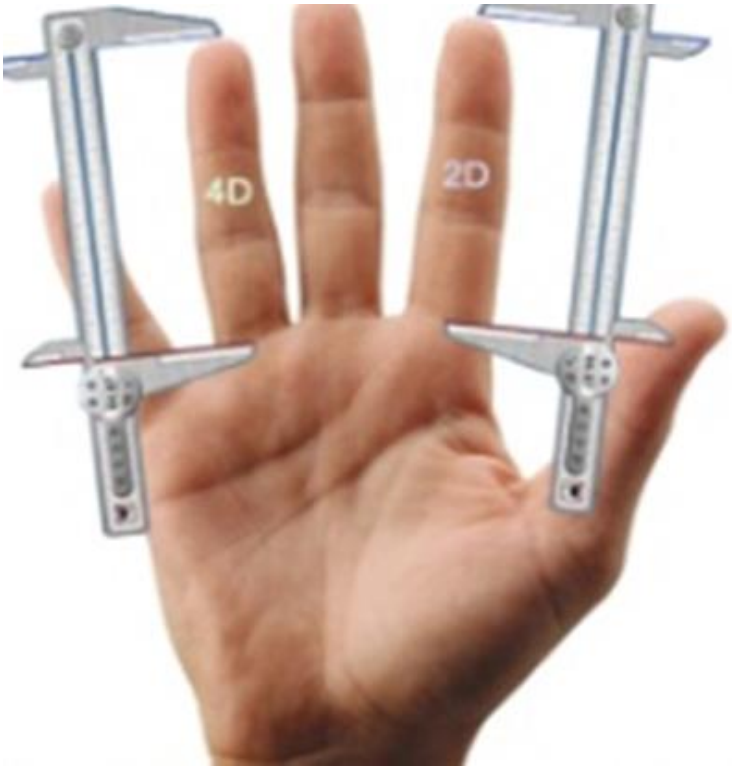


Figure: 1

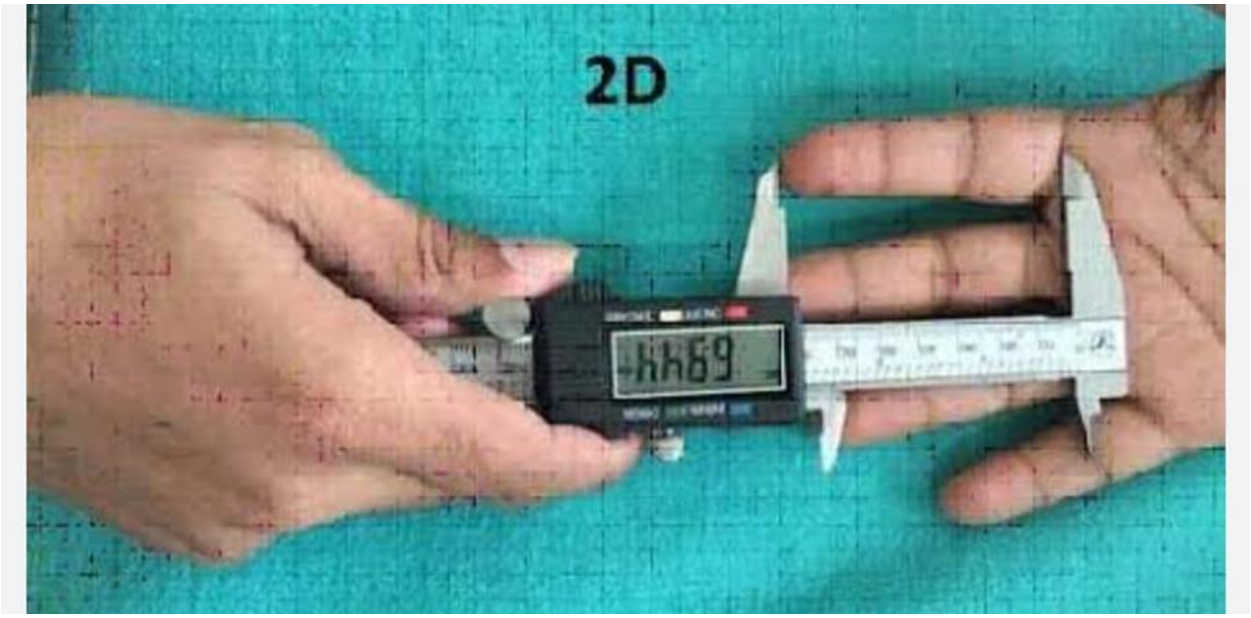


Figure: 2

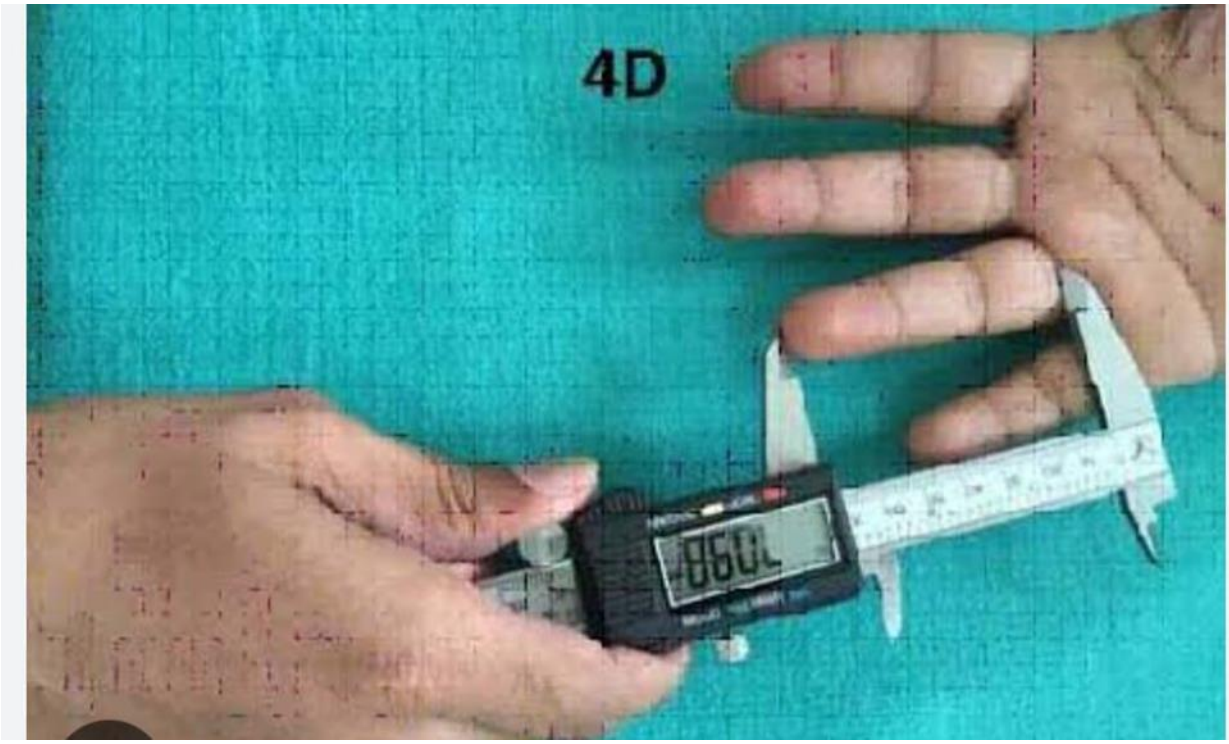


Figure: 3

FINDINGS OF THE STUDY

Table: I

Descriptive Statistics of Basketball Players in Relation to Digit Ratio

Variables	Mean	SD	Range
Height	193.96	7.63	26.00
Left Hand 2D	102.35	8.47	40.20
Left Hand 4D	103.14	8.42	39.00
Right Hand 2D	103.36	7.67	38.60
Right Hand 4D	104.26	7.73	38.80
Left Hand Digit Ratio	0.79	0.44	1.60
Right Hand Digit Ratio	0.90	0.36	1.80

Table no.1 revealed the descriptive statistics of Basketball players in relation to Left and Right hand Digit Ratio. The obtained mean and standard deviation of Elite Basketball Players, Left Hand Ratio 2D:4D is 0.79 ± 0.44 whereas, in respect to right hand digit ratio values 0.90 ± 0.36 for basketball players

On the basis of above table it can be observed that elite and non-elite players have low 2D:4D ration in their left hand.

Table: 2

Relationship of Basketball Performance with Digit Ratio

S. No.	Independent Variable	Dependent Variable	Coefficient	Sig.
1.	Left Hand Digit Ratio	**Basketball Performance**	-.607	**. 001**
2.	Right Hand Digit Ratio		-.551	**.002**

Table: 2 reveal that left hand and right hand digit ratio are significantly correlated with Basketball Performance, where obtained correlation coefficient values of digit ratio, -0.607 and -0.551 are significant at 0.05 level of significance.

Graph: IV

Relationship of Basketball Performance with Digit Ratio

Table: 3

Model Summery of Digit Ratio in Relation to Basketball Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F-ratio	Sig.
1	.607	.368	.346	1.57	16.33	**.001**

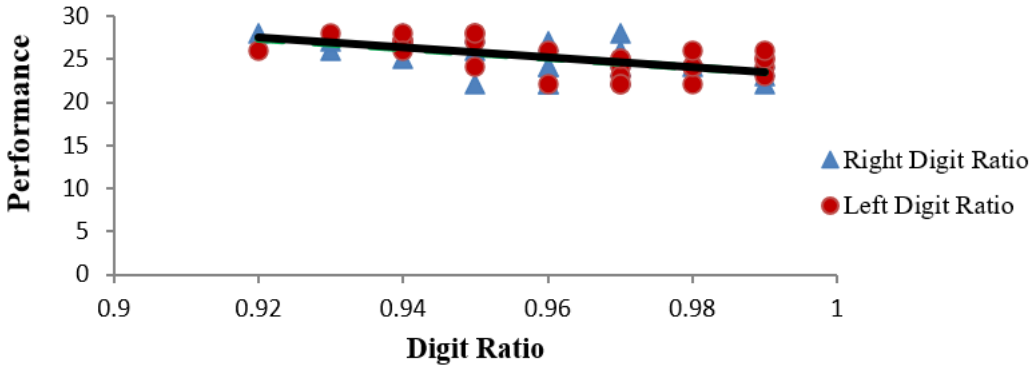
Predictors: (Constant), Left Hand Digit Ratio

This regression model reveals that selected predictor variables are significantly related with basketball performance where R represents the multiple correlations between all the predictor variables and the criterion variable. Thus, the obtained correlation value is found significant, where obtained R (0.607) found significant at 0.05 level of significance.

R^2 represent the total amount of variance accounted for in the criterion variable by the predictor variables. Thus, the amount of variance is 36.8 % in basketball performance by left hand digit ratio. Adjusted R^2 is a reduced value for R square which represent the actual variance in criterion variables due to predictors. Therefore, the actual variance is 34.6 % in basketball performance and F value reveals that regression model is significant or not for prediction. Obtained F value 16.33 is significant at 0.001 level, which means that regression model cause variance in criterion variable and significant for prediction.

Table: 4

Standardized Coefficient Table for Predictor Variables (Digit Ratio) of Basketball Performance



Estimated Basketball Performance = 80.725+ Left Hand Digit Ratio (-57.713)

Model	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
	B	Std. Error	Beta		
(Constant)	80.725	13.749		5.871	0
Left Hand Digit Ratio	-57.713	14.279	-0.607	-4.042	0.001

Table: 4 reveals that values of regression coefficients is positively affecting the dependent variable, means increase in value of left hand digit ratio lead to increase in Basketball performance at rate of respected coefficient value. **t** value indicates the significance of predictor variable in model and t value of left hand digit ratio is significant at 0.05 level hence left hand digit ratio is contributing to increase the performance.

DISCUSSION OF FINDING

The objective of present study was to investigate the relationship of digit ratio with performance of elite basketball players. For the purpose of present study 30 elite men basketball players were selected purposely from different parts of the country. The age of subjects was ranged between 12 to 25 years. Findings of the study suggest that there is significant correlation between left and right hand digit ratio with performance of elite basketball players, where coefficient of 'r' is -.607 and -.551 respectively. Further in another study on Australian Basketball Players **Freak and et al., 2016** concluded that there were significant differences between competitive standards for the left 2D:4D following Bonferroni correction. Whereas in a study conducted by **Klapprodt et al., 2018** on professional and semi-professional male basketball players has revealed that 2D:4D was a moderate correlation of points scored and assists to turnovers ratio, indicating that males with lower 2D:4Ds were generally better offensively as they recorded more points and assists relative to turnovers.

REFERENCES

[1] Austina, E. J., Manningb, J. T., McInroya, K. & Mathewsb, E. (2001). A Preliminary Investigation of the Associations Between Personality, Cognitive Ability and Digit Ratio. Personality and Individual Differences. 33, 115–1124

[2] Best, J. W. (1963). Research in Education. U.S.A.: Prentice Hall. Bucher, C. A. (1983). Foundation of Physical Education and Sports. Saint Louis: The C.V. Mosby Company.

[3] Clarke, H. H. and Clarke, D. H. (1987). Application of Measurement to Physical Education. 6TH ed, Prentice – hall Inc.

[4] Hönekopp,J., ∗, Manning J. T. & Müller, C. (2006). Digit ratio (2D:4D) and Physical Fitness in Males and Females: Evidence for Effects of Prenatal Androgens on Sexually Selected Traits. Hormones and Behavior. 49, 545–549.

[5] Matveyev, L. (1981). Fundamentals of Sports Training. Moscow: Progress Publishers.

[6] Singer, R. N. (1984). Sustaining Movement in Sport. Tallahassee: Sport Consultants International Inc.

[7] Verma, J. P. (2000). Sports Statistics. Gwalior: Venus Publications.

[8] Zeng, F. H. (1992). Scientific Talent Selection on Athletes. Peoples' Sports Press.

[9] Ziegler, S. (1972). An Overview of Anxiety Management Strategies in Sports. Sports Psychology - An Analysis of Athlete Behavior. Ithaca New York.

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