Analysis Of Few Physical Characteristics Of College-Level Male Volleyball Players To Predict Their Playing Ability

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Prediction, Volleyball, Physical Variables, College Level, Playing Ability.

ABSTRACT
The study's goal was to predict college-level male volleyball players' playing prowess based on a few physical characteristics. In order to accomplish this, 255 male volleyball players, ages 17 to 25, were chosen at random from different colleges in the Indian state of Karnataka. In this study, predictor variables like physical attributes like speed, agility, flexibility, leg explosive power, muscular endurance, and cardio-respiratory endurance were used to forecast volleyball playing ability. Three certified volleyball coaches evaluated the playing ability, which was defined as the performance factor, subjectively. Pearson product moment correlation coefficients, step-by-step argument methods of multiple regressions to determine which predictor variable, based on each predictor's contribution, had the highest correlation with the criterion variables entered in the equation. The results revealed that the agility, leg explosive power and muscular endurance become the common characteristics which can predict the Volleyball playing ability among college level men players.

1. Introduction

The ability of a volleyball player to quickly adapt to a game situation and use his entire body to gain an advantage is one of the most crucial aspects of performance. Physical attributes like strength, speed, agility, and flexibility are thought to be crucial for volleyball play. Good volleyball players must possess a variety of motor skills in addition to optimal muscle strength. Numerous studies have shown a correlation between physical attributes and volleyball skills [1]. Schaun et al. [11] discovered a strong correlation between volleyball playing ability and motor and physical fitness variables. They reported that performance of volleyball player is greatly dependent upon agility and lower limb strength. According to Peeri et al. [9], there is a significant correlation between physical attributes and volleyball skills. They found that height, body mass index, and leg explosive strength all affect a volleyball player's ability to attack and defend. In a group of volleyball players, Bojonic et al. [3] also reported a correlation between situation competence and motor potential. When evaluating volleyball players' situational competency, they discovered that balance, speed, strength, and coordination were all helpful.

Making predictions about the future based on data from the past or present is one of the objectives of scientific research. In our daily lives, we encounter a variety of prediction types, including wealth forecasts, market forecasts, share market forecasts, election trends, and more. These predictions are trustworthy because they are founded on certain established facts [2,4]. Sports and game research has demonstrated that by analysing specific variables that are found to be the foundation of overall performance, it is possible to forecast an individual's or a team's future performance [6,7]. The physical characteristics that determine a person's playing ability are more significant than other factors. Given that the researcher is a volleyball player, official, and coach, he believed that an analytical study was necessary to distinguish the variables that are linked to predicting collegiate

men's volleyball players' success. Additionally, there was a dearth [5] of research on volleyball players, which inspired the researcher to start the study.

2. Materials and Methods

The study's goal was to predict college-level male volleyball players' playing prowess based on a few physical characteristics. In order to accomplish this, 255 male volleyball players, ages 17 to 25, were chosen at random from different colleges in the Indian state of Karnataka. Only those who played for their respective collegiate teams were included in the study, and the subjects had played volleyball for at least three years prior. In this study, predictor variables like physical attributes like speed, agility, flexibility, leg explosive power, muscular endurance, and cardio-respiratory endurance were used to forecast volleyball playing ability. Three certified volleyball coaches evaluated the playing ability, which was defined as the performance factor, subjectively. Six independent variables and one dependent variable—the volleyball players' playing ability—made up the current study. As detailed below, statistical analysis was performed on the collected data. Pearson product moment correlation coefficients were used to calculate the relationship between the chosen physical characteristics and volleyball playing ability. Multiple regression calculations were also employed. A criterion variable was predicted from a set of predictors in multiple regressions. This study employed step-by-step argument methods of multiple regressions to determine which predictor variable, based on each predictor's contribution, had the highest correlation with the criterion variables entered in the equation.

3. Results

Table I. Descriptive statistics of playing ability in volleyball from selected physical and anthropometrical variables among college level men players

S.No	Variables	Range	Minimum	Maximum	Mean	SD (±)
1	Speed	0.82	7.29	8.11	7.57	0.21
2	Agility	1.32	11.37	12.69	11.85	0.39
3	Flexibility	12.20	35.60	47.80	41.50	3.01
4	Leg Explosive Power	0.16	1.78	1.94	1.85	0.03
5	Muscular Endurance	9.00	47.00	56.00	51.03	2.23
6	Cardio Respiratory Endurance	250.00	1950	2200	2101.50	79.47
7	Playing Ability	4.00	5.00	9.00	7.59	0.97

Table I displayed the descriptive statistics for volleyball playing ability among college-level male players as well as the range, minimum, maximum, mean, and standard deviation of playing ability based on specific physical variables. The current study made an effort to correlate certain physical characteristics among collegiate-level male volleyball players with the coaches' evaluation as a gauge of playing ability.

Graph I. Profile plots of selected variables

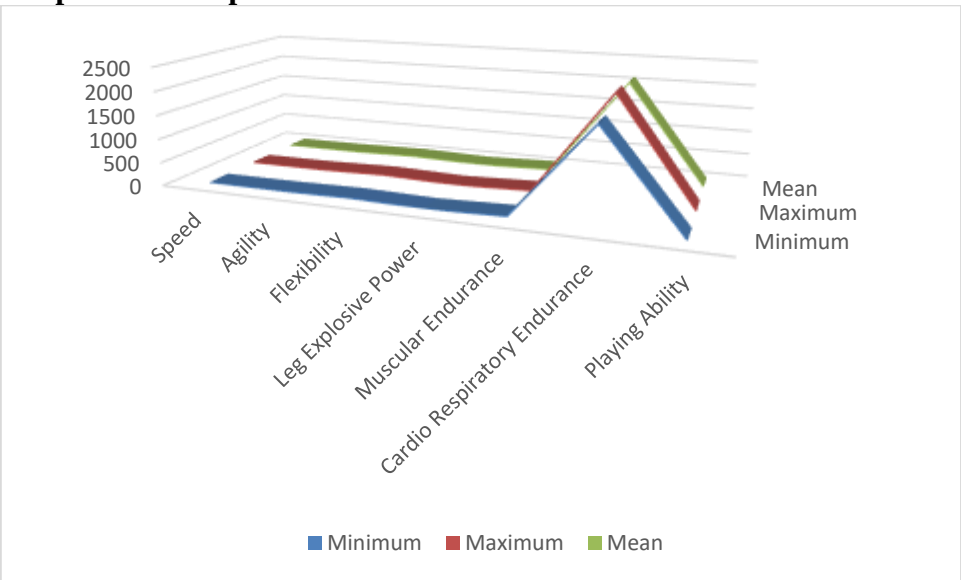

Table II. Inter-correlation of selected variables with the playing ability in volleyball among college level men players

S.No	C.R	V_1	V_2	V_3	V_4	V_5	V_6
V_1	0.02	1					
V_2	0.12*	0.43**	1				
V_3	0.06	0.56**	0.12*	1			
V_4	0.17**	0.22**	0.33**	0.22**	1		
V_5	0.28**	0.16*	0.25**	0.15**	0.60**	1	
V_6	0.08	0.06	0.04	0.09	0.12*	0.05	1

In addition to being higher than the necessary table "r" value of 0.12 to be significant at the 0.05 level, the results demonstrated a significant correlation between the volleyball playing ability and the selected variables of agility (r = 0.12), leg explosive power (r = 0.17), and muscular endurance (r = 0.28). The ability to play volleyball did not significantly correlate with speed (r = 0.02), flexibility (r = 0.06), or cardio-respiratory endurance (r = 0.08).

Table III. Analysis of variance for the influence of independent variables on playing ability in volleyball among college level men players

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	147.517	1	147.517	187.039*	.000[b]
	Residual	191.653	243	.788		
	Total	369.170	244			
2	Regression	185.479	2	92.739	122.178*	.000[c]
	Residual	183.691	242	.759		
	Total	389.170	243			
3	Regression	197.956	3	65.985	92.880*	.000[d]
	Residual	171.214	241	.710		
	Total	359.170	242			

Table III made it abundantly evident that the F values of 187.039, 122.178, and 92.880, respectively, were significant at the 0.05 level. It was discovered that all of the independent factors combined to affect college-level male volleyball players' playing prowess. Multiple regressions were calculated because the F ratio was significant. Only because the multiple correlations were high enough to support a prediction from the multiple regression equation was it computed. The independent variables to be included and their order in the regression equation were then determined by the correlation.

Table IV. Step wise multiple regression between playing ability in volleyball and independent variables among college level men players

Model	Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	Agility	.671[a]	.464	.463	.76819
2	Leg Explosive Power	.688[b]	.488	.485	.75256
3	Muscular Endurance	.724[c]	.554	.543	.68955

The multiple correlation coefficient for predictors like agility, leg explosive power, and muscular endurance was 0.724, which generated the highest multiple correlations with volleyball playing ability, according to Table IV. The following order is indicated by "R" square values, which indicate the percentage contribution of predictors to volleyball playing ability (dependent variables).

1. About 67% of the variation of playing ability in volleyball was explained by the regression model with one predictor agility.
2. About 68% of the variation of playing ability in volleyball was explained by the regression model with two predictors - agility and leg explosive power. An additional 1% of the variance in the volleyball playing ability was contributed by calf girth.
3. About 72% of the variation of playing ability in volleyball was explained by the regression model with three predictors – agility, leg explosive power and muscular endurance. An additional 4% of the variance in the Volleyball playing ability was contributed by agility.

Table V. Regression analysis of prediction equation of college level men volleyball players

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.	Partial Correlations	Collinearity Statistics
		B	Std. Error	Beta			
Step1	(Constant)	9.264	1.067		.000		
	Agility	.008	.000	.671	.000	.671	1.000
Step 2	(Constant)	-10.473	1.161		.000		
	Agility	.008	.000	.663	.000	.680	1.000
	Leg explosive power	.055	.015	.143	.000	.202	1.000
Step 3	(Constant)	-12.172	2.423		.000		
	Agility	.009	.000	.625	.000	.665	.914
	Leg explosive power	.079	.014	.202	.000	.271	.892
	Muscular endurance	.225	.102	.127	.002	.171	.857

In the Table – V, the following regression equations were derived for playing ability of Volleyball players with dependent variables.
Regression Equation in obtained scores from = CR

Playing Ability (CR) = (CR) = 9.264 +0.009(V_2) +0.079(V_3) +0.225(V_4)

C.R	Playing ability
V_2	Agility
V_4	Leg Explosive Power
V_5	Muscular Endurance

Leg explosive power, muscular endurance, and agility are all included in the regression equation used to predict volleyball playing ability. It is clear that the regression equation obtained has a high predictive validity because the multiple correlations on volleyball playing ability with the combined effect of these independent variables are highly significant [8,10].

Conclusion

1. The results revealed that an Inter – relationship exists significantly between the physical variables among college level men volleyball players.
2. The size of multiple correlation is sufficiently large and hence regression equation developed by six variables can be put in to prediction equation of volleyball players.
3. The results revealed that the agility, leg explosive power and muscular endurance become the common characteristics which can predict the Volleyball playing ability among college level men players.

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