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ORIGINAL ARTICLE

ANALYSIS OF VOLLEYBALL PLAYING ABILITY FROM SELECTED ANTHROPOMETRIC CHARACTERISTICS OF COLLEGE LEVEL PLAYERS

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Abstract:

The purpose of the study was to analyse the Volleyball playing ability from the selected anthropometrical variables among College level players. To achieve the purpose two hundred and fourteen inter - collegiate Volleyball players were randomly selected from various colleges in Tamilnadu state, India and their age ranged from 17 to 25 years. The subjects had past playing experience of at least three years in Volleyball and only those who represented their respective college teams were taken as subjects. The anthropometrical variables namely – Body weight, Standing Height, Arm length, Arm span, Chest, waist, Hip and Thigh. The playing ability was assessed by three qualified Volleyball coaches which was taken as performance factor. Each coach will rate the playing ability of the selected players in 100 points scale for each subject. The research pilot study was used to determine the methods of testing, evaluate the competency of the investigator testings, recording of timings, scores and field equipments for the present investigation. The inter - relationship among the selected anthropometrical and motor fitness variables and Volleyball playing ability, were computed by using Pearson' product-moment correlation coefficients. The computation of multiple regression was also used. In multiple regressions, a criterion variables from a set of predictors was predicted. Step wise argument methods of multiple regression was used in this study to find out the predictor variable that has the highest correlation with the criterion variables were entered in the equation depending on the contribution of each predictor. The SPSS 15 version package was used to determine the predictive equation. The results revealed that there was a strong correlation exists between the playing ability versus arm length, height, thigh girth and chest girth. The results also revealed that length, height, thigh girth and chest girth becomes the common anthropometrical characteristics which can predict the playing ability in Volleyball players.

KEY WORDS:

Volleyball, Anthropometric, College players, Playing Ability.

INTRODUCTION

Volleyball is a complex game of simple skills. It has also shown in recent years that there is a trend that volleyball payers adopt the technique, tactics and physical performance. Volleyball game requires comprehensive ability including physical, technical, mental and tactical abilities. Among them physical abilities of players exert marked effects on the skills of the players themselves and the tactics of the team. The skills like higher attack, powerful jumping-serve, attack from the back row and aggressive blocking are

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now widely used by volleyball players. All these bring forward greater demand for specific physical fitness and physique of volleyball players. In volleyball, technical and tactical skills, anthropometric characteristics and individual physical performance capacities are most important factors that contribute to the success of a team in competitions (Hakkinen, 1993).

Kretschmer (1920) the father of modern body (somato - type) defined three types by adding an in-between and referred to them as asthenic (lean), athletic, and pyknic (heavy). There is profound positive relationship between performance in sports and the anthropometric aspects of an athlete's body. It has been scientifically proved that different sports or different events in a same sport require the demand of different bodily characteristics. The player's anthropometric dimensions, reflecting body shape, proportionality and composition, are variables which play a major role in determining the potential for success in chosen sport (Papadopoulou, et al. 2002).

MATERIALS AND METHODS

The purpose of the study was to analyse the Volleyball playing ability from the selected anthropometrical variables among College level players. To achieve the purpose two hundred and fourteen inter - collegiate Volleyball players were randomly selected from various colleges in Tamilnadu state, India and their age ranged from 17 to 25 years. The subjects had past playing experience of at least three years in Volleyball and only those who represented their respective college teams were taken as subjects. The anthropometrical variables namely – Body weight, Standing Height, Arm length, Arm span, Chest, waist, Hip and Thigh. The playing ability was assessed by three qualified Volleyball coaches which was taken as performance factor. The guideline for assessment was provided by the investigators. Each coach will rate the playing ability of the selected players in 100 points scale for each subject. The rating given on each subjects will be added and will be divided by 3 to make the individual score of the subject. Prior to the formal study sessions, a pilot study was conducted with twenty players who were not subjected of the research were selected from MDT Hindu College, Tirunelveli District, Tamilnadu, India. The research pilot study was used to determine the methods of testing, evaluate the competency of the investigator testings, recording of timings, scores and field equipments for the present investigation. The inter - relationship among the selected anthropometrical and motor fitness variables and Volleyball playing ability, were computed by using Pearson' product-moment correlation coefficients. The computation of multiple regression was also used. In multiple regressions, a criterion variables from a set of predictors was predicted. Step wise argument methods of multiple regression was used in this study to find out the predictor variable that has the highest correlation with the criterion variables were entered in the equation depending on the contribution of each predictor. The SPSS 15 version package was used to determine the predictive equation.

RESULTS

Table – 1 Descriptive Statistics of Volleyball Players

S.No	Variables	Mean (N = 82)	SD
1	Body Weight	67.11	± 9.34
2	Height	178.82	±7.85
	Arm Length	83.11	±4.66
3	Arm Span	178.44	±8.43
4	Chest	91.63	±9.04
5	Waist	68.31	±5.75
6	Hip	87.64	±5.71
7	Thigh	49.73	±4.22
8	Playing ability	72.22	±12.93

Table – 1 showed the descriptive statistics – Mean and Standard deviation of anthropometric characteristics & playing ability of Volleyball Players. The present study attempted to link the coaches rating as measure of playing ability with the anthropometric characteristics of Volleyball Players, correlation analysis was made.

Table – 2 Inter-Correlation of Selected Anthropometric Variables with the Playing Ability of Volleyball Players

Variables	Ratings	Weight	Height	Arm Length	Arm Span	Chest	Waist	Hip	Thigh
Ratings	–	0.91	0.92	0.91	0.90	0.39	0.43	0.89	0.26
Weight		–	0.34	0.60	0.52	0.56	0.61	0.52	0.62
Height			–	0.93	0.88	0.67	0.45	0.87	0.23
Arm Length				--	0.79	0.32	0.31	0.81	0.22
Arm Span					--	0.34	0.65	0.89	0.25
Chest						--	0.54	0.94	0.27
Waist							--	0.30	0.81
Hip								--	0.61
Thigh									--

Table – 2 shows that there was a strong correlation exists between the playing ability versus weight (r = 0.91), height (r = 0.92), Arm length (r = 0.91), Arm span (r = 0.90) and hip (r = 0.90) respectively and also chest (r = 0.39), waist (r = 0.43) and thigh (r = 0.26) were supported by the moderete correlation with the playing ability. Next, by means of forward selection the model of linear regression for predicting the playing ability of Volleyball players was analysed. As shown in the table – 3, specific anthropometric characteristics play a supportive role in helping athletes perform better under the actual competitive conditions.

Table – 3 Regression Analysis of Predictive Equation in Volleyball Players

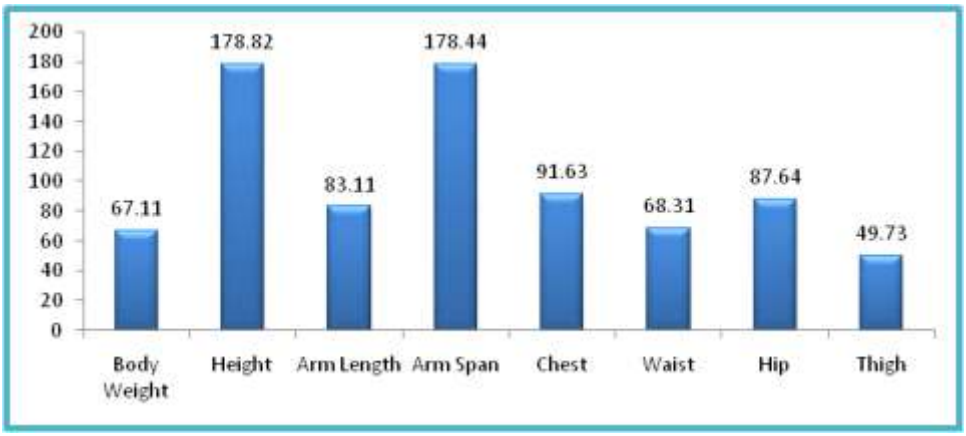
Variables		R^2	Unstandardized Coefficients		Standardized Coefficients Beta
			b	SE b	β
Step 1	Constant		-143.106	7.069	
	Arm length	.913	2.643	0.087	0.969
Step 2	Constant		-153.049	6.444	
	Arm length		1.947	0.163	0.717
	Height	.927	2.729	0.562	0.247
Step 3	Constant		-164.103	7.451	
	Arm length		1.399	0.213	0.528
	Height		2.799	0.564	0.284
	Thigh	.935	.228	0.070	0.234
Step 4	Constant		-182.599	11.428	
	Arm length		0.689	0.407	0.234
	Height		2.335	0.520	0.278
	Thigh		0.249	0.094	0.173
	Chest	.944	0.464	0.264	0.353

From the table the following regression equation were derived for Volleyball with dependent variables.

Playing Ability = -143.106 + 0.689 (AL) + 2.335 (H) + 0.249 (TG) + 0.464 (CG)

Table – 3 shows the Regression Analysis of Predictive Equation in Volleyball Players in the samples. Among the anthropometric variables, arm length scores accounted for 91 % in the first model of the performance ability. The height, thigh and chest subsequently added significantly (0.01 and 0.05 levels) to the prediction of the playing ability in volleyball players up to the final model. The R2 value for the combination of the arm length, hand Span, arm span, height on the playing ability was .944 (94 %) with the R2 change (? R2) 4.56 for the final model.

Figure I. Mean Values of Anthropometric Characteristics among Volleyball Players



CONCLUSIONS

The results obtained in the present study illustrated the formation of anthropometric optimum predictive equation models in male Volleyball players. From the analysis of data,

1.The results revealed that there was a strong correlation exists between the playing ability versus arm length, height, thigh girth and chest girth.
2.The results also revealed that length, height, thigh girth and chest girth becomes the common anthropometrical characteristics which can predict the playing ability in Volleyball players.

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