A Study of Predictive Physical Variables of Spiking in Volleyball Players of South Gujarat Region

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ABSTRACTS

The objective of this research study is to predict the most contributory factor which affects the spiking performance of south Gujarat players. twenty male spikers in volleyball from south Gujarat region were selected as subjects, these twenty spikers were sorted from nearly thirty spikers by the panel of three experts who have judge them during competition and practice sessions. These twenty male spikers were mainly district players who represents state as well as university. Hence the data for Physical variables selected for the study were taken at the level of 0.05 significance. The multiple correlation was applied to find out the combine contribution of Physical variables to spiking in volleyball. Multiple regression equation was developed In order to predict the most contributory factor towards spiking in volleyball for Physical variables. In all cases 0.05 level was fixed to test the hypothesis of this study.

It has been observed that the contributory physical variables which affects spiking performance were back strength, arm-shoulder strength, leg strength, speed, agility and spine flexibility.

INTRODUCTION

Men have consistently strived to run faster, jump higher and exhibit greater strength, endurance and skill. We are unsurprisingly competitive and ambitious for excellence in performance. As a result of practical experience, old methods of conditioning, though captivating and rich in tradition, have been superfluous and replaced by new and advanced methods based on insight and understanding with the help of sophisticated equipment.

High sports performance is not merely the product of physical, psychological and physiological prerequisites crazed by an individual sportsman. High performances are achieved after a elongated period of training supported directly or indirectly by the society.

In the hectic scenario of modern life, sports activities have got much more relevance in the context of men and women getting physical exercise and thereby keeping oneself fit and inhabiting their leisure hours in a useful manner. However, competitive sports need more training and repeated practice to enable the player or athlete to perform well.

LITERATURE REVIEW

Bakker (1969)[1] selected twenty eight members of the women's extramural volleyball teams at Illinois state university as subjects. Two experienced volleyball coaches established the criterion by rating each player on her playing ability. The following variables were measured: height, weight, leg extensor, strength, using the multiple angle, testing unit, grip strength using an adjustable dynamometer, skinfolds using the Lange Caliper, jumping ability using the jump and reach test, and an apparatus constructed by the investigator to measure reactional movement times. Through T test and correlation ships it was found that jumping ability and reaction time were significantly related to success in volleyball.

Agility is an imperative factor in the prediction of performance in volleyball, Joseph (1983)[2] resolute the relationship of power, agility, shoulder flexibility, arm length and leg length to volleyball playing capability. Thirty male volleyball players were selected as subjects from LNIPE Gwalior, Sargent Jump measures the power, 40 meters shuttle run has been made to measure agility, and shoulder flexibility by graded stick and steel tape was used to measure arm length and leg length, the playing and skill as based on the average subjective judgement of three experts. Product moment correlation was used to statistically examine the data and it was clinched that, playing ability of men volleyball players mainly depend on power which is most dependable single variable. Arm length and leg length are also unswerving variables in prediction of playing capacity of male volleyball players. In prediction of playing ability of male volleyball players the inconsequential relationship has been shown by the variables like agility and shoulder flexibility.

Devi (1985)[3] evaluated twenty-four volleyball players to find out the relationship of selected strength and flexibility measures to playing capability in volleyball. The volleyball playing ability was significantly linked to arm strength and abdominal strength as per her verdicts and conclusion. Volleyball playing ability did not relate to grip strength significantly as per the findings. And the volleyball playing ability had an insignificant relationship with wrist flexibility and ankle flexibility.

OBJECTIVE

1. To find out contributory physical variables effects on spiking performance.
2. To find out the most contributory factor in physical variables which affects spiking performance in volleyball players of south Gujarat region.

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[1] Bakker, Clarena (1969). Factors Associated With Success in Volleyball. Completed Research in Health, Physical Education and Recreation, 11: 106.

[2] Joseph V.K, (1983) "Relationship of Power, Agility, Flexibility and Measurements of Selected Body Segments to Volleyball Playing Ability", Unpublished Master's Thesis, Jiwaji University.

[3] Devi K. S, (1985) "Relationship of Selected Strength and Flexibility Measure to Playing Ability in Volleyball", Unpublished Master's Thesis Jiwaji University, Gwalior.

SELECTION OF SUBJECTS

20 male players were players who represented district and state level tournaments from south Gujarat region.

MEASUREMENT STANDARDS

Standard equipment's were used for specific variables which has been taken for the study.

STATISTICAL PROCESS

The data which was collected by various procedures were standardized and taken for further statistical procedure where multiple correlation was applied and multiple regression equation was done to predict the most contributory factor in volleyball spiking.

LIMITATIONS

1. Certain factors like diet, daily routine, life style, habits, etc. which might have effect on the result of the study cannot be controlled.
2. Variations in meteorological status like atmospheric temperature, humidity etc.., during the study period, could not be controlled.
3. The heredity factors, which might have influenced the results of this study, could not be controlled.

RESULTS OF THE STUDY

The results of the study for the above paper. Which can been seen in following tables.

Co-efficient of Correlation between spiking performance to Physical Variables

In the below table the physical variables were selected as per the guidelines of the experts which plays important role during spiking performance.

Descriptive Statistics			
	Mean	Std. Deviation	N
TOTAL PERFORMANCE	12.2000	1.39925	20
HIP FLEXIBILITY	160.7500	15.69068	20
SPINE FLEXIBILITY	58.3000	9.69590	20
ARM-SHOULDER STRENGTH	4492.8000	1063.66410	20
SPEED	6.6465	.43241	20
WRIST FLEXIBILITY	141.7000	13.96273	20
BACK STRENGTH	127.8000	11.61940	20
AGILITY	25.1540	1.12932	20
LEG STRENGTH	146.0500	19.54610	20
ANKLE FLEXIBILITY	76.5000	12.72999	20
SHOULDER FLEXIBILITY	257.7500	11.76916	20

Table No. 1 Coefficient Of Correlation 'R'	
Variables Correlated	**Coefficient Of Correlation 'R'**
Hip Flexibility And Spiking Performance	-0.86
Spine Flexibility And Spiking Performance	.515*
Arm-Shoulder Strength And Spiking Performance	.630**
Speed And Spiking Performance	-.615**
Wrist Flexibility And Spiking Performance	.348
Back Strength And Spiking Performance	.786**
Agility And Spiking Performance	-.561*
Leg Strength And Spiking Performance	.819**
Ankle Flexibility And Spiking Performance	.346
Shoulder Flexibility And Spiking Performance	.326

N=20

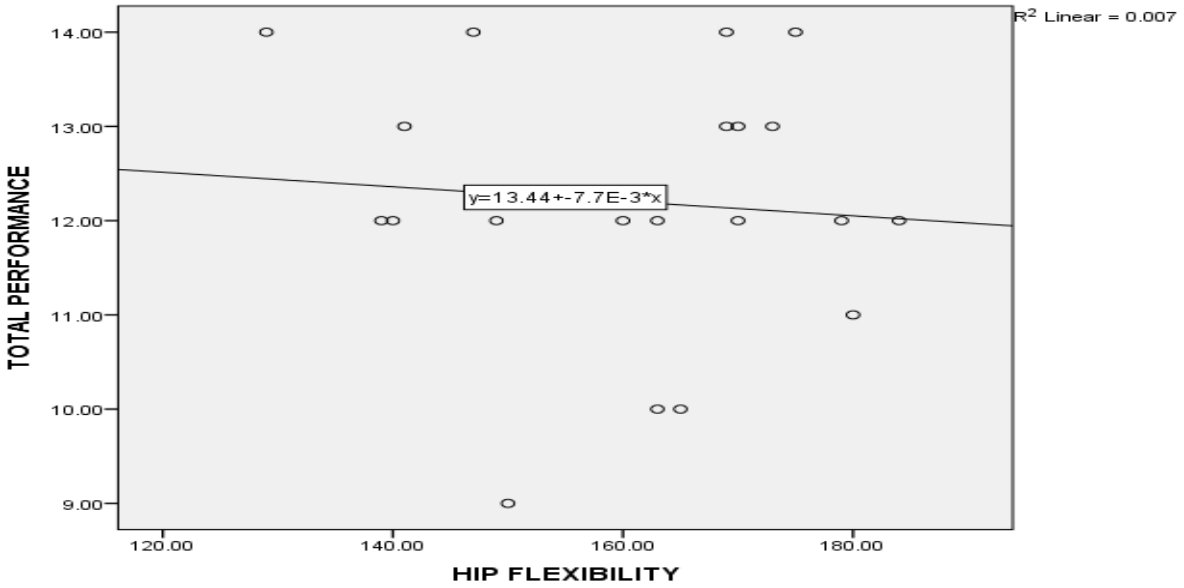
**significant at .01 level. r.01 (20) = .537

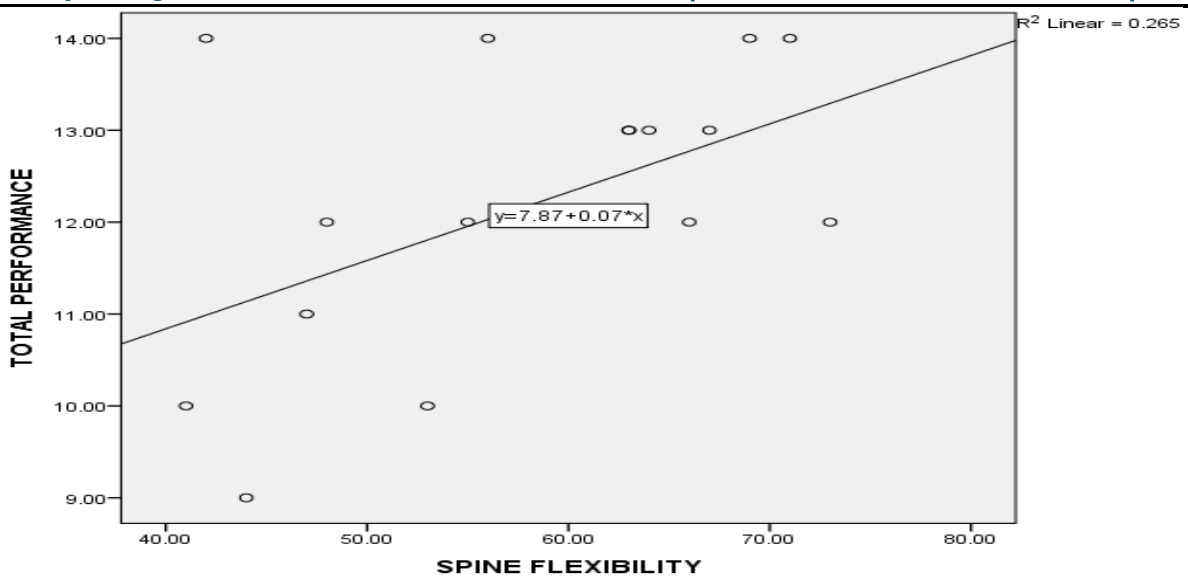
*significant at .05 level. r.05 (20) = .423

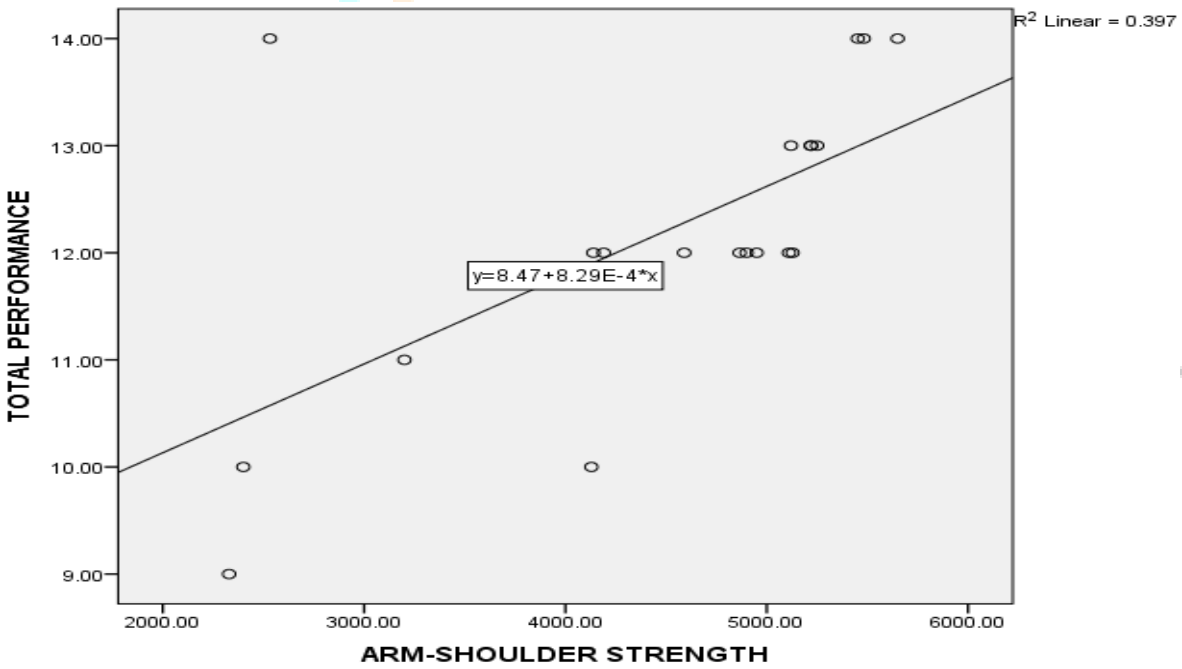
An interpretation of above table no 1 indicates that spiking performance of the volley ball is significantly related to spine flexibility (r = .515*), arm-shoulder strength (r=.630**), back strength (r=.786**), leg strength (r = .819**). The variables like speed (r=-615**) and agility (r=-561*) shows negative significant correlation but as it was based on time trial so the player who consumes lesser time considered more accurate thus these two variables was taken as positively correlated significant correlation.

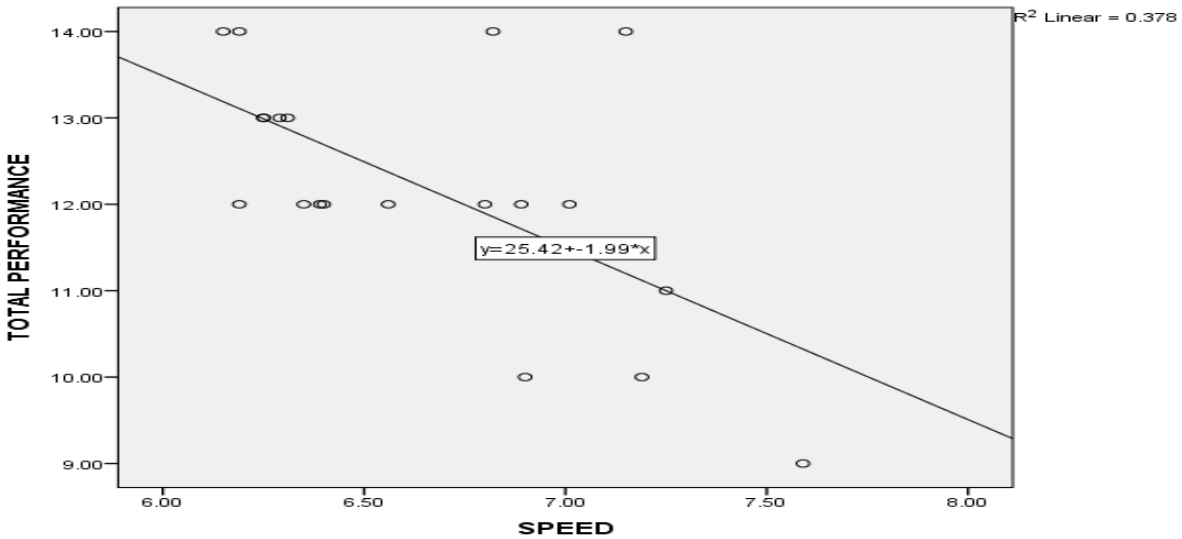
Table further reveals that spiking performance is not significance to hip flexibility, wrist flexibility, ankle flexibility, and shoulder flexibility. As their correlation values at .05 level is less than (r=.423)

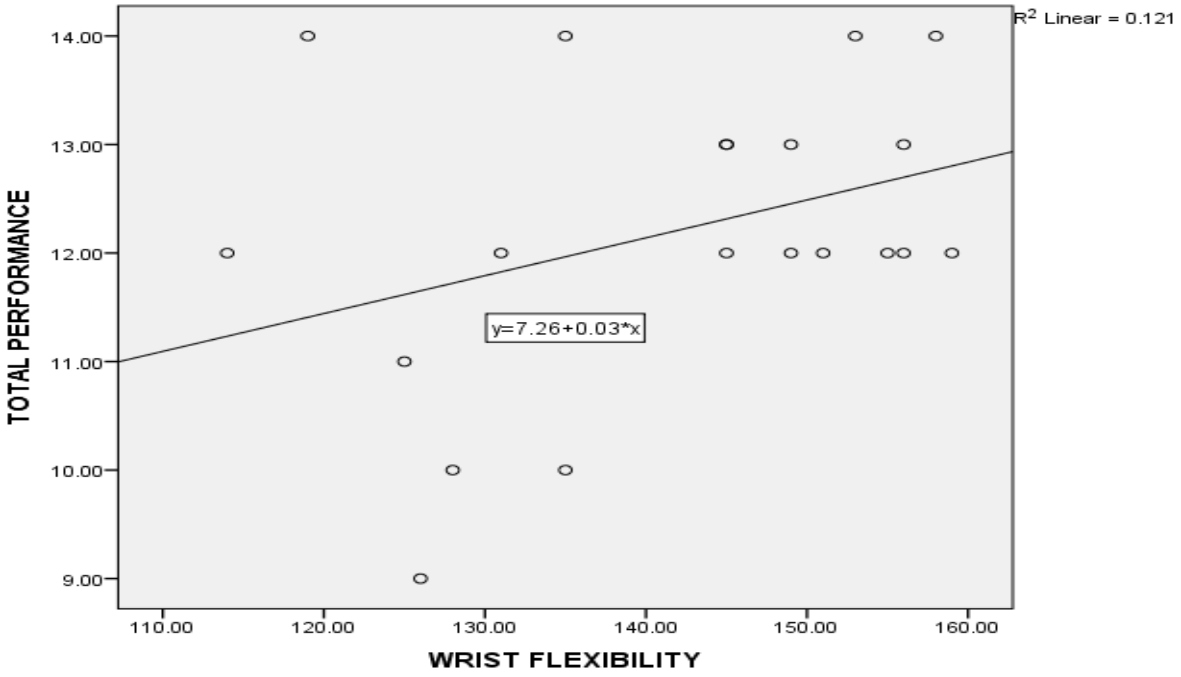
Scatter plots showing the correlations of physical variables to spiking performance

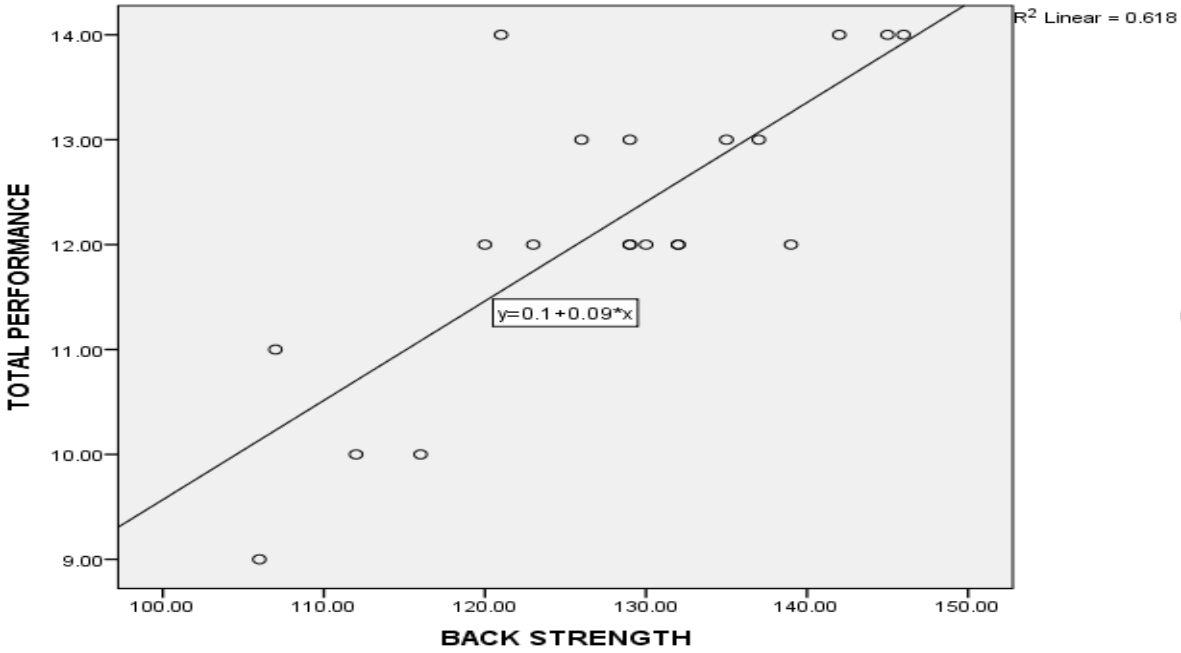


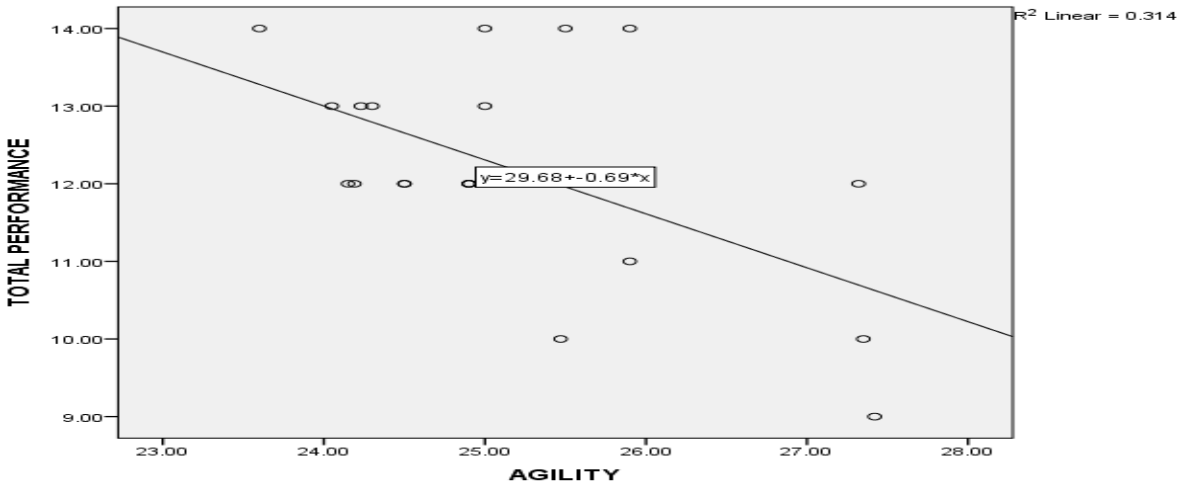

R² Linear = 0.265
y=7.87+0.07*x
TOTAL PERFORMANCE
SPINE FLEXIBILITY
14.00
13.00
12.00
11.00
10.00
9.00
40.00
50.00
60.00
70.00
80.00

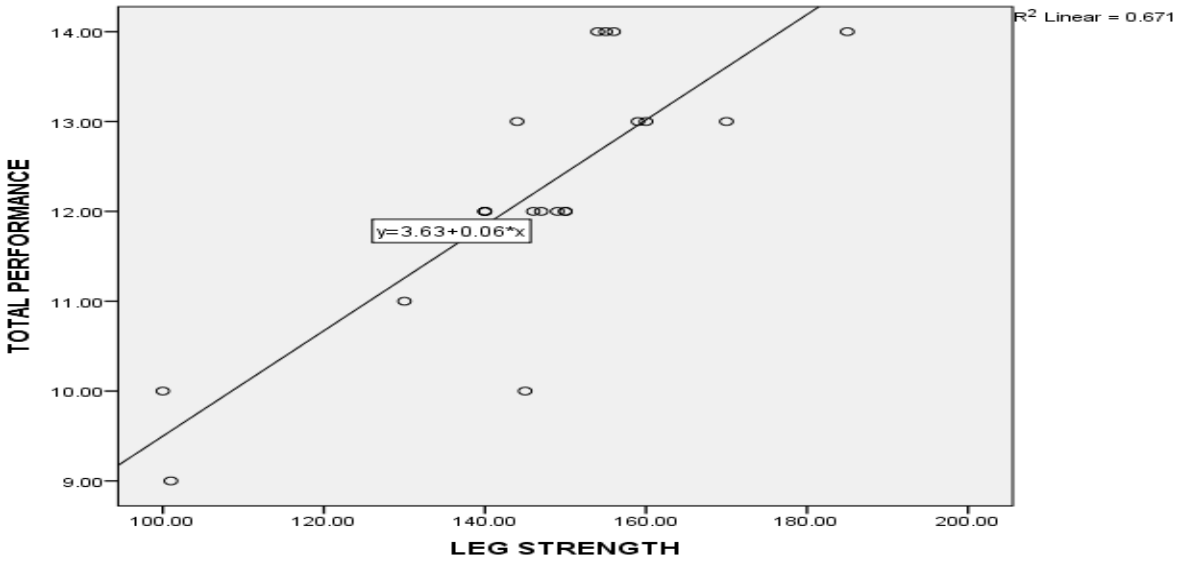

R² Linear = 0.397
y=8.47+8.29E-4*x
TOTAL PERFORMANCE
ARM-SHOULDER STRENGTH
14.00
13.00
12.00
11.00
10.00
9.00
2000.00
3000.00
4000.00
5000.00
6000.00

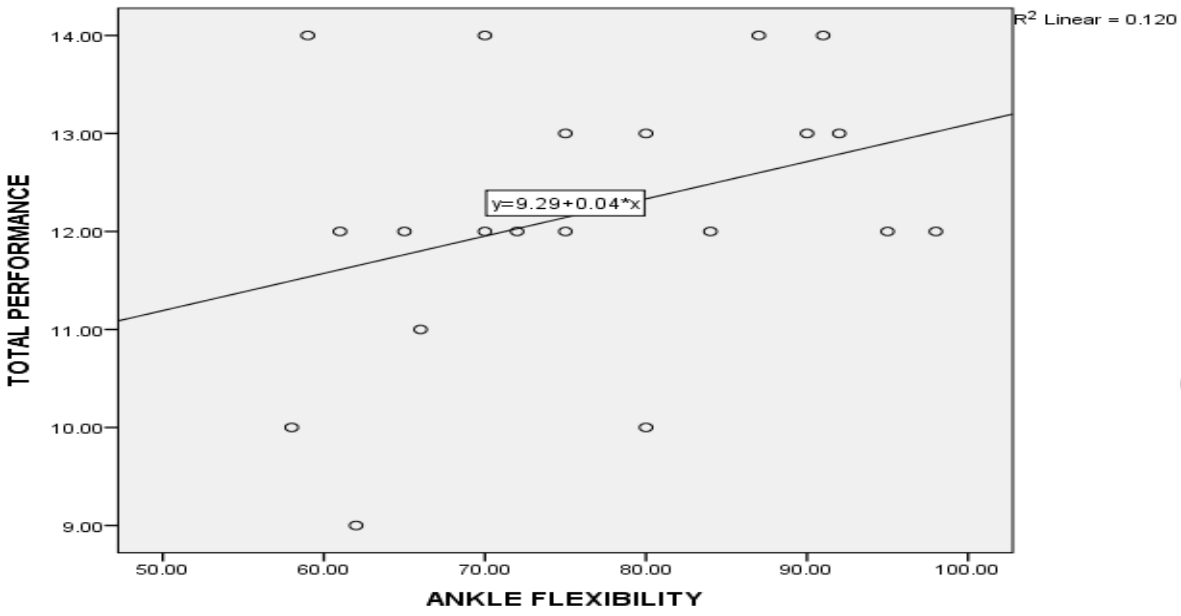

R² Linear = 0.378
y=25.42+-1.99*x
TOTAL PERFORMANCE
SPEED
14.00
13.00
12.00
11.00
10.00
9.00
6.00
6.50
7.00
7.50
8.00

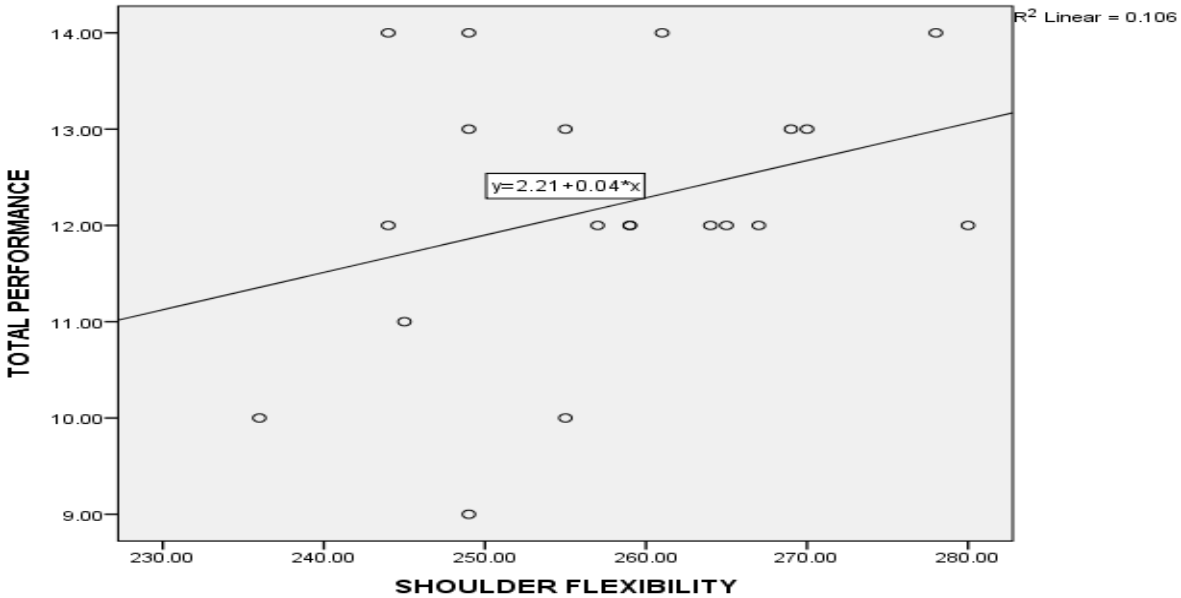

R² Linear = 0.121
TOTAL PERFORMANCE
WRIST FLEXIBILITY
y=7.26+0.03*x
14.00
13.00
12.00
11.00
10.00
9.00
110.00
120.00
130.00
140.00
150.00
160.00


R² Linear = 0.618
TOTAL PERFORMANCE
BACK STRENGTH
y=0.1+0.09*x
14.00
13.00
12.00
11.00
10.00
9.00
100.00
110.00
120.00
130.00
140.00
150.00


R² Linear = 0.314
TOTAL PERFORMANCE
AGILITY
y=29.68+-0.69*x
14.00
13.00
12.00
11.00
10.00
9.00
23.00
24.00
25.00
26.00
27.00
28.00


R² Linear = 0.671
y=3.63+0.06*x
TOTAL PERFORMANCE
LEG STRENGTH
14.00
13.00
12.00
11.00
10.00
9.00
100.00
120.00
140.00
160.00
180.00
200.00


R² Linear = 0.120
y=9.29+0.04*x
TOTAL PERFORMANCE
ANKLE FLEXIBILITY
14.00
13.00
12.00
11.00
10.00
9.00
50.00
60.00
70.00
80.00
90.00
100.00


R² Linear = 0.106
y=2.21+0.04*x
TOTAL PERFORMANCE
SHOULDER FLEXIBILITY
14.00
13.00
12.00
11.00
10.00
9.00
230.00
240.00
250.00
260.00
270.00
280.00

The above scatter plots diagrams shows that each physical variables were correlated to spiking performance in volleyball. These diagrams were displayed to get better view and better understanding.

COMBINE CONTRIBUTION OF PHYSICAL VARIABLES TO SPIKING PERFORMANCE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.935[a]	.875	.817	.59920	.875	15.101	6	13	.000

a. Predictors: (Constant), LEG STRENGTH, AGILITY, BACK STRENGTH, ARM-SHOULDER STRENGTH, SPEED, SPINE FLEXIBILITY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.838	11.050		-.347	.734
	SPINE FLEXIBILITY	-.088	.040	-.610	-2.224	.044
	ARM-SHOULDER STRENGTH	.001	.000	.646	2.809	.015
	SPEED	1.049	.714	.324	1.468	.166
	BACK STRENGTH	.087	.021	.722	4.080	.001
	AGILITY	-.194	.237	-.157	-.817	.429
	LEG STRENGTH	.028	.012	.397	2.360	.035

a. Dependent Variable: TOTAL PERFORMANCE

The above table shows the significant variables and Beta coefficients value of each physical variables. It shows the highest coefficient Beta value of back strength (.722) followed by Arm-Shoulder strength (.646), leg strength (.397), speed (.324), agility (-.157) spine flexibility (-610).

Regression Model

Performance as a dependent variable and Physical as independent variables

From the above table the regression equation was set as under.

$$\text{Spiking performance} = -3.838 - .610 \times X_1 - .157 \times X_2 + .324 \times X_3 + .397 \times X_4 + .646 \times X_5 + .722 \times X_6$$

Where, $y_=$ the dependent variable, α is the y intercept which means the value of y when all the x values are zero, $x_{1=}$ spine flexibility, $x_{2=}$ agility, $x3_=$ speed, x4= leg strength, x5= arm-shoulder strength, x6= back strength, $\beta_=$ the coefficient of the independent variable.

The value of the multi co-relation coefficients between independent variables and dependent variable is 0.935. The value of R^2 (0.875). The value of adjusted R^2 (0.817)

FINDINGS AND CONCLUSION

From the data analysis and interpretation, it has been concluded that the spiking performance of volleyball players of South Gujarat Region was good. It has been further observed that the most contributory factor which affects spiking in volleyball under physical variables is **back strength** with highest significance, it is obvious that spiking must include explosive power and that can be raised through back strength, followed by **arm-shoulder strength** which is also very important factor to generate power and movement. **Leg strength** also pays significant role for spiking as the jump for spike highly depends on leg strength and approach and landing is must for a good spiker which comes from leg strength. Other variables which contributes to spiking performance were **speed**, **agility, spine flexibility.**

REFRENCES

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