

CHAPTER IV

RESULTS AND DISCUSSIONS

4.1 OVERVIEW

The fundamental task of scientific enquiry is to explain or predict a phenomenon. In order to explain or predict a phenomena, a number of complex constructs needs to be scientifically investigated. The purpose of the study was to predict hockey playing ability from selected physical, physiological, biochemical and skill variables of women hockey players.

To achieve the purpose of the study, the investigator selected 100 women hockey players who competed at district level hockey tournaments from Chennai, Thiruvallur and Kancheepuram districts. The subjects selected were in the age group between 18 to 25 years.

In this study, the hockey playing ability was predicted for 100 women hockey players with the help of selected predictor variables such as speed, agility, resting pulse rate, vital capacity, high density lipoprotein, low density lipoprotein, dribbling and hitting and dribbling and goal shooting. The hockey playing ability was determined by subjective rating of the girls by three experts and was used as the criterion variable. The backward selection in multiple regression method was used to determine the prediction equation (Thomas and Nelson, 1990).

4.2 TEST OF SIGNIFICANCE

As Clarke and Clarke (1987) says, “these data must be analysed in ways appropriate to the research design. Such analysis can only be appropriate to the research design through the application of pertinent statistics”.

This is the vital portion of thesis achieving the conclusion by examining the hypotheses. The procedure of testing the hypotheses was either by accepting the hypotheses or rejecting the same in accordance with the results obtained in relation to the level of confidence.

The test was usually called the test of significance since we test whether the relationship between dependent and criterion variable scores were significant or not. In this study, if the obtained r-value were greater than the table value, the null hypotheses were rejected to the effect that there existed significant relationship between dependent and criterion variables and if the obtained values were lesser than the required values, then the null hypotheses were accepted to the effect that there existed no significant relationship between the criterion variables.

4.2.1 LEVEL OF SIGNIFICANCE

The hockey playing ability of the women hockey players were predicted from selected physical, physiological, biochemical and skill variables in this study. The selected criterion variable, hockey playing ability were predicted from dependent variables, speed, agility, resting pulse rate, vital capacity, HDL, LDL,

dribbling and hitting and dribbling and goal shooting. The backward selection in multiple regression method was used to determine the prediction equation (Thomas and Nelson, 1990). In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

In this study, if the obtained 'r' and F value were greater than the table value, the null hypotheses were rejected to the effect that there existed significant relationship between dependent and criterion variables and if the obtained values were lesser than the required values at 0.05 level, then the null hypotheses were accepted to the effect that there existed no significant relationship among the means variables under study.

4.3 COMPUTATION OF DESCRIPTIVE STATISTICS

The results on the descriptive statistics consisting of mean, standard deviation and range of the selected physical, physiological, biochemical and skill variables of women hockey players are presented in Table IV.

Table IV**Descriptive Statistics on Selected Physical, Physiological, Biochemical and Skill Variables of Hockey Women Players**

Sl. No.	Variables	Mean (M)	Standard Deviation (SD)	Range
1	Agility	10.44	±0.97	9.10-12.35
2	Speed	7.30	±0.77	6.10-8.96
3	Vital Capacity	3735	±468.91	2800-4500
4	Resting Pulse rate	67.17	±3.58	60-72
5	HDL	65.19	±3.79	60-75
6	LDL	72.30	±8.89	57-92
7	Dribbling and Hitting	12	±0.91	11.01-14.48
8	Dribbling and Goal shooting	29.85	±3.41	22-38
9	Playing Ability	67.13	±7.21	50-85

The results presented in Table IV proved that the agility of the subjects was 10.44 seconds with standard deviation of ± 0.97 . The mean value of speed was 7.30 seconds with standard deviation of ± 0.77 . The mean value of vital capacity of the subjects was 3735 milliliters with standard deviation of ± 468.91 . The mean value of resting pulse rate of the subjects was 67.17 beats / minute with standard deviation of ± 3.58 . The mean value of HDL of the subjects was 65.17 mg/dl with standard deviation of ± 3.79 . The mean value of LDL of the subjects was 72.30 mg/dl with standard deviation of ± 8.89 . The mean value of dribbling and hitting was 12 seconds with standard deviation of ± 0.91 . The mean value of dribbling and goal shooting was 29.85 points with standard deviation of ± 3.41 . The mean

scores of playing ability of the subjects was 67.13 points with standard deviation of ± 7.21 .

4.4 COMPUTATION OF ZERO ORDER CORRELATION

In order to find out the simple relationship between playing ability and selected physical, physiological, biochemical and skill variables, zero order correlation was computed and the results presented in Table V.

Table V

Zero order Correlation Between Playing ability and Selected Physical, Physiological, Biochemical and Skill Variables

S.No.	Variables	Correlation Coefficient	Required 'r'
	Playing Ability Vs		
1	Agility	-0.777*	0.195
2	Speed	-0.666*	
3	Vital Capacity	0.520*	
4	Resting Heart Rate	-0.828*	
5	HDL	0.565*	
6	LDL	-0.659*	
7	Dribbling and Hitting	-0.597*	
8	Dribbling and Goal Shooting	0.745*	

* Significant at 0.05 level.

In Table V the Pearson correlation of the criterion variable Hockey ability with the predictor variables are presented in the following order namely dribbling

and hitting, dribbling and goal shooting, agility, speed, vital capacity, resting pulse rate, HDL, LDL.

The results proved that the selected skill variables namely, dribbling and hitting, dribbling and goal shooting were significantly correlated with the criterion variable hockey playing ability as the obtained r values -0.597 and 0.745 respectively were greater than the required r value 0.195 to be significant at 0.05 level.

The results proved that the selected physical fitness variables namely agility and speed were significantly correlated with the criterion variable hockey playing ability as the obtained r values -0.777 and -0.666 respectively were greater than the required r value 0.195 to be significant at 0.05 level.

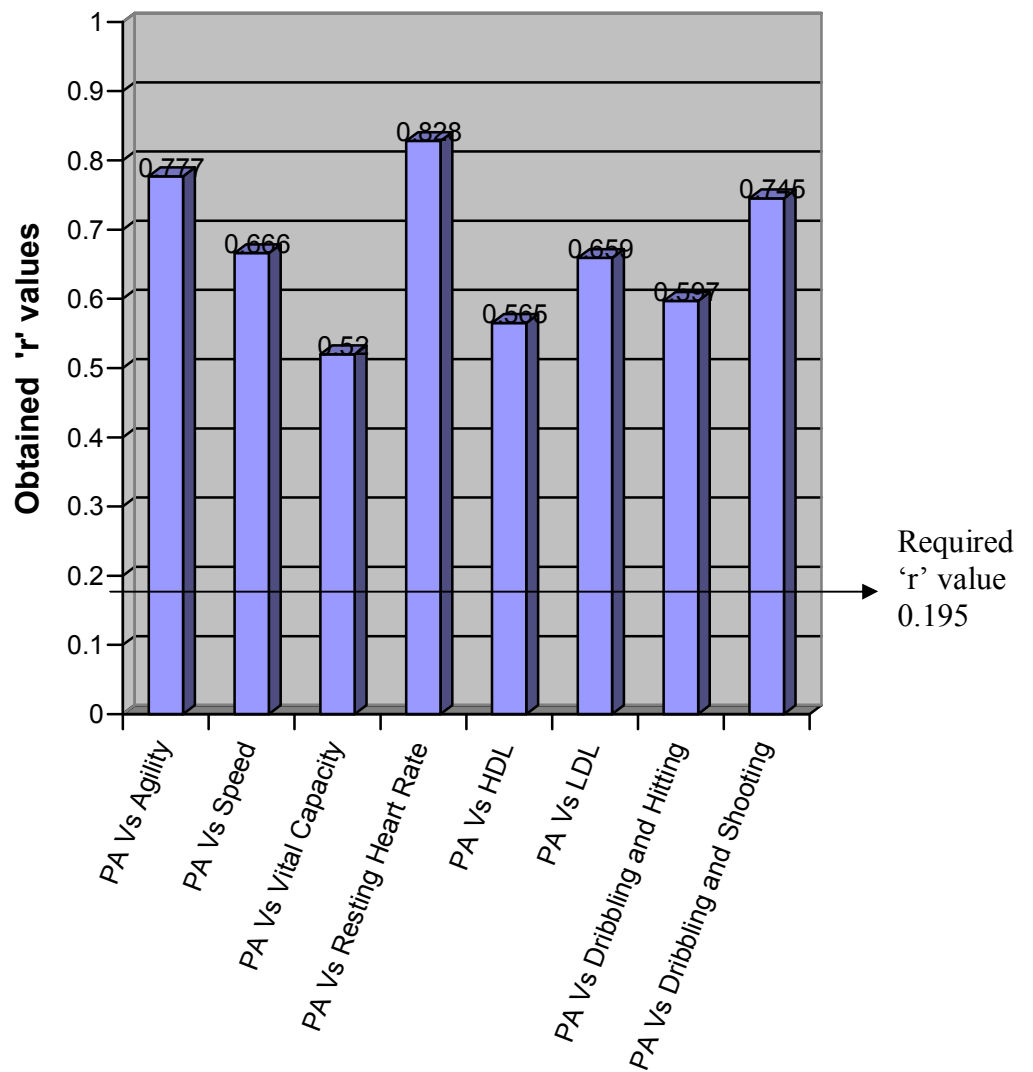
The results proved that the selected physiological variables namely vital capacity and resting pulse rate were significantly correlated with the criterion variable hockey playing ability as the obtained r values -0.520 and -0.828 respectively were greater than the required r value 0.195 to be significant at 0.05 level.

The results proved that the selected biochemical variables namely HDL and LDL were significantly correlated with the criterion variable hockey playing ability as the obtained r values 0.565 and -0.659 respectively were greater than the required r value 0.195 to be significant at 0.05 level.

The obtained results were presented through bar diagram for better understanding of the results in figure 9.

Figure 9

Bar Diagram Showing the Obtained 'r' values between Playing Ability and Selected Variables



4.5 COMPUTATION OF PARTIAL CORRELATION

The results on computation of partial correlation among the variables selected were presented below:

Table VI

Partial Correlation between Playing Ability and Agility (Variable) with other variables (Controls)

Variable	Control variable	Partial correlation coefficient
Playing ability & agility		-0.772
	Dribbling & hitting	-0.453
	Dribbling & hitting Dribbling & Goal shooting accuracy	-0.337
	Dribbling & hitting Dribbling & Goal shooting accuracy Speed	-0.153
	Dribbling & hitting Dribbling & Goal shooting accuracy Speed Vital capacity	-0.083
	Dribbling & hitting Dribbling & Goal shooting accuracy Speed Vital capacity Resting pulse rate	-0.079
	Dribbling & hitting Dribbling & Goal shooting accuracy Speed Vital capacity Resting pulse rate HDL	-0.048
	Dribbling & hitting Dribbling & Goal shooting accuracy Speed Vital capacity Resting pulse rate HDL LDL	-0.015

The above table VI shows the results of relationship between hockey playing ability and agility by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, speed, vital capacity, resting pulse rate, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and agility was -0.772 which shows that they were negatively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and agility initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, speed, vital capacity, resting pulse rate, HDL and LDL were also eliminated one by one using partial correlation method. The above table shows that 32% was the influence of dribbling and hitting on the hockey playing ability and agility. The influence of dribbling and goal accuracy on playing ability and agility was approximately 12%. The influence of speed on playing ability and agility was 18%. The influence of vital capacity on playing ability and agility was approximately 7%. The resting pulse rate had no influence on playing ability and agility. The HDL had an influence about 3% and LDL had about 3% on playing ability and agility.

Table VII

Partial Correlation between Playing Ability and Speed (Variable) with other variables (Controls)

Variable	Control variable	Partial correlation coefficient
Playing ability & Speed		-0.763
	Dribbling & hitting	-0.585
	Dribbling & hitting Dribbling & Goal shooting accuracy	-0.476
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility	-0.385
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Vital capacity	-0.364
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Vital capacity Resting pulse rate	-0.238
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Vital capacity Resting pulse rate HDL	-0.215
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Vital capacity Resting pulse rate HDL LDL	-0.171

The above table VII shows the results of relationship between hockey playing ability and speed by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, vital capacity, resting pulse rate, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and agility was -0.763 which shows that they were negatively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and speed initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, vital capacity, resting pulse rate, HDL and LDL were also eliminated one by one using partial correlation method. The above table shows that 18% was the influence of dribbling and hitting on the hockey playing ability and speed. The influence of dribbling and goal accuracy on playing ability and speed was approximately 11%. The influence of agility on playing ability and speed was 9%. The influence of vital capacity on playing ability and agility was approximately 2%. The resting pulse rate had 12% influences on playing ability and speed. The HDL had an influence about 2% and LDL had about 4% on playing ability and speed.

Table VIII**Partial Correlation between Playing Ability and Vital Capacity (Variable)
with other variables (Controls)**

Variable	Control variable	Partial correlation coefficient
Playing ability & Vital Capacity		0.766
	Dribbling & hitting	0.471
	Dribbling & hitting Dribbling & Goal shooting accuracy	0.383
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility	0.343
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed	0.274
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Resting pulse rate	0.243
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Resting pulse rate HDL	0.231
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Resting pulse rate HDL LDL	0.192

The above table VIII shows the results of relationship between hockey playing ability and vital capacity by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, speed, resting pulse rate, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and vital capacity was 0.766 which shows that they were positively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and vital capacity initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, resting pulse rate, HDL and LDL were also eliminated one by one using partial correlation method. The above table shows that 36% was the influence of dribbling and hitting on the hockey playing ability and vital capacity. The influence of dribbling and goal accuracy on playing ability and vital capacity was approximately 8%. The influence of agility on playing ability and vital capacity was 4%. The influence of speed on playing ability and vital capacity was approximately 6%. The vital capacity had 3% influences on playing ability and vital capacity. The HDL had an influence about 1% and LDL had about 4% on playing ability and vital capacity.

Table IX**Partial Correlation between Playing Ability and Resting Pulse Rate (Variable)
with other variables (Controls)**

Variable	Control variable	Partial correlation coefficient
Playing ability & Resting pulse rate		-0.828
	Dribbling & hitting	-0.642
	Dribbling & hitting Dribbling & Goal shooting accuracy	-0.531
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility	-0.464
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed	-0.374
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital capacity	-0.353
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity HDL	-0.322
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity HDL LDL	-0.328

The above table IX shows the results of relationship between hockey playing ability and Resting pulse rate by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, speed, vital capacity, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and Resting pulse rate was -0.828 which shows that they were negatively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and Resting pulse rate initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, vital capacity, HDL and LDL were also eliminated one by one using partial correlation method. The above table shows that 18% was the influence of dribbling and hitting on the hockey playing ability and Resting pulse rate. The influence of dribbling and goal accuracy on playing ability and Resting pulse rate was approximately 11%. The influence of agility on playing ability and Resting pulse rate was 6%. The influence of speed on playing ability and Resting pulse rate was approximately 9%. The vital capacity had 2% influences on playing ability and Resting pulse rate. The HDL had an influence about 3% and LDL had no influence on playing ability and Resting pulse rate.

Table X**Partial Correlation between Playing Ability and HDL (Variable) with other variables (Controls)**

Variable	Control variable	Partial correlation coefficient
Playing ability & HDL		0.705
	Dribbling & hitting	0.472
	Dribbling & hitting Dribbling & Goal shooting accuracy	0.340
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility	0.312
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed	0.225
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital capacity	0.196
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity Resting pulse rate	0.125
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity Resting pulse rate LDL	0.125

The above table X shows the results of relationship between hockey playing ability and HDL by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, speed, vital capacity, Resting pulse rate and LDL among women hockey players. The zero order correlation coefficient between playing ability and HDL was -0.705 which shows that they were positively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and HDL initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, vital capacity, Resting pulse rate and LDL were also eliminated one by one using partial correlation method. The above table shows that 23% was the influence of dribbling and hitting on the hockey playing ability and HDL. The influence of dribbling and goal accuracy on playing ability and HDL was approximately 13%. The influence of agility on playing ability and HDL was 3%. The influence of speed on playing ability and HDL was approximately 9%. The vital capacity had 3% influences on playing ability and HDL. The resting pulse rate had about 7% and HDL had no influence on playing ability and Resting pulse rate.

Table XI

Partial Correlation between Playing Ability and LDL (Variable) with other variables (Controls)

Variable	Control variable	Partial correlation coefficient
Playing ability & LDL		-0.790
	Dribbling & hitting	-0.545
	Dribbling & hitting Dribbling & Goal shooting accuracy	-0.427
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility	-0.330
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed	-0.261
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital capacity	-0.235
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity Resting pulse rate	-0.231
	Dribbling & hitting Dribbling & Goal shooting accuracy Agility Speed Vital Capacity Resting pulse rate HDL	-0.231

The above table XI shows the results of relationship between hockey playing ability and LDL by partialling out the influence of other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, speed, vital capacity, resting pulse rate and HDL among women hockey players. The zero order correlation coefficient between playing ability and LDL was -0.79 which shows that they were negatively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and Resting pulse rate initially, the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently other variables namely, dribbling and hitting, dribbling and goal shooting accuracy, agility, vital capacity, resting pulse rate and HDL were also eliminated one by one using partial correlation method. The above table shows that 24% was the influence of dribbling and hitting on the hockey playing ability and LDL. The influence of dribbling and goal accuracy on playing ability and LDL was approximately 12%. The influence of agility on playing ability and LDL was 9%. The influence of vital capacity on playing ability and LDL was approximately 7%. The resting pulse rate had 2% influences on playing ability and LDL. The HDL had no influence and LDL had no influence on playing ability and LDL.

Table XII

**Partial Correlation between Playing Ability and Dribbling and Hitting
(Variable) with other variables (Controls)**

Variable	Control variable	Partial correlation coefficient
Playing ability & dribbling and hitting		-0.758
	Dribbling & goal shooting accuracy	-0.517
	Dribbling & goal shooting accuracy Agility	-0.310
	Dribbling & goal shooting accuracy Agility Speed	-0.305
	Dribbling & goal shooting accuracy Agility Speed Vital capacity	-0.256
	Dribbling & goal shooting accuracy Agility Speed Vital capacity Resting pulse rate	-0.221
	Dribbling & goal shooting accuracy Agility Speed Vital capacity Resting pulse rate HDL	-0.210
	Dribbling & goal shooting accuracy Agility Speed Vital capacity Resting pulse rate HDL LDL	-0.188

The above table XII shows the results of relationship between hockey playing ability and dribbling and hitting by partialling out the influence of other variables namely, dribbling and goal shooting accuracy, agility, speed, vital capacity, resting pulse rate, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and dribbling and hitting (-0.758) was negatively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and dribbling and hitting, initially the effect of dribbling and goal shooting accuracy was eliminated which shows that 24% was the influence of dribbling and goal shooting accuracy on the hockey playing ability and dribbling and hitting. The influence of agility on playing ability and dribbling and hitting was approximately 21%. The influence of speed on playing ability dribbling and hitting was 1%. The influence of vital capacity on playing ability dribbling and hitting was approximately 5%. The resting pulse rate had approximately 4% influence on playing ability dribbling and hitting. The HDL had an influence about 1% and LDL had about 2% on playing ability dribbling and hitting.

Table XIII

**Partial Correlation between Playing Ability and Dribbling and Goal Shooting
(Variable) with other variables (Controls)**

Variable	Control variable	Partial correlation coefficient
Playing ability & Dribbling & Goal shooting accuracy		0.745
	Dribbling & hitting	0.481
	Dribbling & hitting Agility	0.377
	Dribbling & hitting Agility Speed	0.283
	Dribbling & hitting Agility Speed Vital capacity	0.254
	Dribbling & hitting Agility Speed Vital capacity Resting pulse rate	0.164
	Dribbling & hitting Agility Speed Vital capacity Resting pulse rate HDL	0.139
	Dribbling & hitting Agility Speed Vital capacity Resting pulse rate HDL LDL	0.098

The above table XIII shows the results of relationship between hockey playing ability and dribbling and goal shooting accuracy by partialling out the influence of other variables namely, dribbling and hitting, agility, speed, vital capacity, resting pulse rate, HDL and LDL among women hockey players. The zero order correlation coefficient between playing ability and dribbling and goal shooting accuracy was 0.745 which shows that they were positively correlated and it was significant at 0.05 level. To find out the actual relationship between playing ability and dribbling and goal shooting accuracy, initially the effect of dribbling and hitting was eliminated using partial correlation method. Subsequently the other variables also eliminated using partial correlation technique. From the table, we infer that 26% was the influence of dribbling and hitting on the hockey playing ability and dribbling and goal shooting accuracy. The influence of agility on playing ability and dribbling and goal shooting accuracy was approximately 10%. The influence of speed on playing ability and dribbling and goal shooting accuracy was 9%. The influence of vital capacity on playing ability dribbling and goal shooting accuracy was approximately 3%. The resting pulse rate had approximately 9% influence on playing ability and dribbling and goal shooting accuracy. The HDL had an influence about 2% and LDL had about 4% on playing ability and dribbling and goal shooting accuracy.

4.6 COMPUTATION OF MULTIPLE REGRESSION

To find out the combined association of selected physiological variables, resting pulse rate and vital capacity with the playing ability, multiple regression analysis was made and the results presented in Table XIV.

Table XIV

Multiple R, R Square Adjusted R Square and Standard Error of the Estimate between Playing Ability and Selected Physical, Physiological, Biochemical and Skill Variables among Women Hockey Players

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.899	0.808	0.798	3.24

Table XIV reveals that selected physical, physiological, biochemical and skill variables, are very much influencing the playing ability of women hockey players. From R Square value it is clear that 81% of playing ability of women hockey players is determined by selected variables.

The unstandardized coefficient beta, standard error, standardized beta 't', significance level and the zero order and partial correlation coefficient are presented in Table XV.

Table XV

Predictors Beta values between Playing Ability and Selected Physical, Physiological, Biochemical and Skill Variables among Women Hockey Players

Independent variables	Unstandardized Coefficients		't'	Sig.
	B	Std. Error		
(Constant)	142.1914			
Dribbling and hitting	-1.3203	0.5934	-2.225	0.029
Speed	-1.4497	0.7093	-2.044	0.044
Vital Capacity	0.002436	0.001173	2.078	0.041
Resting Pulse Rate	-0.6801	0.1627	-4.181	0.000
LDL	-0.1665	0.06398	-2.602	0.011

Table XVI shows the significance among the regressed and residual variables.

Table XVI

Showing ANOVA for Regressed and Residual of Criterion and Independent Variables of Women Hockey Players

Variance	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4161.2081	5	832.2416	79.1727*	0.001
Residual	988.1019	942	10.5117		
Total	5149.4100	99			

* Significant at 0.01 level.

Table XV shows that obtained F value of 79.1727, for the selected predictor variables dribbling and hitting, speed, vital capacity, resting pulse rate and LDL.

The obtained F value of 79.1727 was significant at 0.001 level, which was greater than the required 0.05 level fixed for this study.

As the obtained beta were significant, the following multiple regression equation was formulated as the predictors for playing ability from selected physical, physiological, biochemical and skill variables of women hockey players.

$$\text{Playing ability} = 142.1914 - 1.3203 (\text{Dribbling and Hitting}) - 1.4497 (\text{Speed}) + 0.002436 (\text{Vital Capacity}) - 0.6801 (\text{Resting pulse rate}) - 0.1665 (\text{LDL})$$

4.7 DISCUSSIONS ON FINDINGS

In this study, the hockey playing ability was predicted from 100 district level women hockey players with the help of selected predictor variables such as agility, speed, vital capacity, resting pulse rate, HDL, LDL and dribbling and hitting and dribbling and goal shooting. The hockey playing ability was determined by subjective rating by three experts and was used as the criterion variable. The backward selection in multiple regression method was used to determine the prediction equation (**Thomas and Nelson, 1990**).

In backward regression selection method begins with the squared multiple correlation of all the predictor variables with criterion variables. The predictor variables are deleted from the regression equation one at a time, and the last two R square due to deletion of the variable is studied, that is, each variable is treated as if

it were entered last in the equation. Thus, it is possible to find out which variables adds least when entered last in the equation, and the loss in R square is compared against a criterion of meaningfulness as well as significance. Thus, when a variable does not add meaningfully, or significantly to prediction it is deleted, and when no variable is deleted, the analysis is terminated.

The results of this study proved that agility was significantly related with the playing ability ($r=-0.777$) and speed was significantly related with the hockey playing ability of the women hockey players (-0.666). The findings of this study are in agreement with the findings of Koen et.al. (2006) who based on correlation and regression analyses, it was concluded 2 field tests that reflect physical performance in among 21 women field hockey players. And findings of and Hymavathi, (2011) that two years of systematic hockey academy training program had a considerable amplification on aerobic capacity, measured through speed and agility.

The findings of this study further proved that vital capacity was significantly related with playing ability of women hockey players and the obtained 'r' value 0.520 was significant at 0.01 level. It was also found that the physiological variable, resting pulse rate was significantly related with the playing ability of women hockey players as the obtained 'r' value of -0.828 was greater than the required 'r' value of 0.194 to be significant at 0.05 level. Macleod H, and Sunderland C. (2012) and found the reliability of physiological responses that field hockey intermittent

treadmill protocol was significantly related to heart rate and metabolic responses and can be used in conjunction with heart rate or other key performance measures to assess performance of hockey players. Mehrotra et.al. . (1998) assessed the relation between the quality of exercise performed and the quantitative effect of these exercises on the lungs of Indian sportsmen. The findings of this study proved that there was significant ($P < 0.01$) positive relationship between playing ability and vital capacity and there was significant ($P < 0.01$) negative relationship between playing ability and resting heart rate among women hockey players. Thus, the findings of this study proved the different hockey training protocol available to the subjects developed resting pulse rate and vital capacity and are significantly related with their playing ability and are in agreement with the studies of Macleod H, and Sunderland C. (2012) and Mehrotra et.al. . (1998).

Gulshan Lal Khanna' and Prakash Chandra Dhara, (2010) and I. Manna, and G.L. Khanna, (2010) found out the variation of age and training on biochemical variables of Indian elite hockey players. The mean values of high density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C) have been increased significantly ($P < 0.05$) with the advancement of age of players comparing to junior level players. The results of this study proved that there was significant positive relationship between playing ability and HDL of the women hockey players as the obtained 'r' value of 0.565 was greater than the required 'r' value of 0.194 to be significant at 0.05 level. There was significant

negative relationship between hockey playing ability and LDL of the women hockey players as the obtained 'r' value was -0.659. The findings of this study are in agreement with the findings of Gulshan et.al. (2010) and Manna and Khanna (2010). The reason for similar increased HDL and reduced LDL would be because of training induced changes on these biochemical variables as found by P.C. Dhara, (2009) that the training induced changes on different physiological and biochemical parameters in young Indian field hockey players. significant reductions ($P < 0.05$) were noted in hemoglobin, total cholesterol, triglyceride and LDLC after the training. On the other hand plasma levels of urea, uric acid and HDLC were increased significantly ($P < 0.05$) following the training.

Puterman J, Schorer J, and Baker J, (2010) based on regression analysis indicated shot preferences were associated with scoring more goals, and concluded models of skilled perception improves playing ability in hockey. Surhat Muniroglu, (2001) found the performance values of hockey players such as dribbling and agility determines the overall performance competency. Weber CL, and DaltonCT, (2003) reported that talent identification female field hockey should include assessments of sprinting speed, agility, and dribbling control. The results of this study proved that there was significant negative relationship between playing ability and dribbling and hitting as the obtained 'r' value of -0.597 was greater than the required 'r' value of 0.194 to be significant at 0.05 level. There was positive relationship between playing ability and dribbling and goal shooting

accuracy of the women hockey players as the obtained 'r' was 0.745. The findings of this study are in agreement with the previous studies cited.

4.7 DISCUSSIONS ON HYPOTHESIS

The formulated hypothesis number 1 stated that there would be a significant relationship between physical fitness components and hockey performance. The obtained results (table IV) proved that there was significant relationship between hockey playing ability and physical fitness variable agility ($r = -0.777$) and hockey playing ability and physical fitness variable speed ($r = 0.666$) and the obtained 'r' values were greater than the required 'r' value of 0.194 to be significant at 0.05 level and hence, the hypothesis was accepted at 0.05 level.

The formulated hypothesis number 2 stated that there would be a significant relationship between physiological variables and hockey performance. The obtained results (table IV) proved that there was significant relationship between hockey playing ability and physiological variable vital capacity ($r = 0.520$) and hockey playing ability and physiological variable resting pulse rate ($r = -0.828$) and the obtained 'r' values were greater than the required 'r' value of 0.194 to be significant at 0.05 level and hence, the hypothesis was accepted at 0.05 level.

The formulated hypothesis number 3 stated that there would be a significant relationship between biochemical variables and hockey performance. The obtained results (table IV) proved that there was significant relationship between hockey

playing ability and biochemical variable HDL ($r = 0.565$) and hockey playing ability and biochemical variable LDL ($r = -0.659$) and the obtained 'r' values were greater than the required 'r' value of 0.194 to be significant at 0.05 level and hence, the hypothesis was accepted at 0.05 level.

The formulated hypothesis number 4 stated that there would be a significant relationship between skill variables and hockey performance. The obtained results (table IV) proved that there was significant relationship between hockey playing ability and dribbling and hitting ($r = -0.595$) and hockey playing ability and dribbling and goal shooting ($r = 0.745$) and the obtained 'r' values were greater than the required 'r' value of 0.194 to be significant at 0.05 level and hence, the hypothesis was accepted at 0.05 level.

The formulated hypothesis 5 stated that hockey playing ability would be predicted significantly from the predictive factors namely speed, agility, resting pulse rate, vital capacity, HDL, LDL, dribbling and hitting and dribbling and shooting and the results of the study proved that hockey playing ability of the women hockey players were successfully predicted and the formulated hypothesis was accepted at 0.05 level.