Chapter IV

ANALYSIS AND INTERPRETATION OF THE DATA

The purpose of the present study was to determine the basketball playing ability from selected fundamental skills, physical, physiological, psychological and anthropometrical variables among university women basketball players. To achieve the purpose of the study, two hundred women university basketball players were selected randomly from various universities who participated in the South Zone Inter University Basketball Tournament. The age of the subjects ranged from 17 to 25 years. The following variables were selected for this study such as, passing, shooting, dribbling, speed, grip strength, agility, leg explosive power, resting pulse rate, breath holding time, state anxiety, self-confidence, achievement motivation, aggression, height, weight, arm length and leg length.

The present study consists of one dependent variable, namely playing ability of basketball players, and seventeen independent variables. Collected data was subjected to statistical analysis as explained below. To determine the relationship between dependent variable and independent variable Pearson product moment correlation was used. The computation of multiple regressions was also used. In multiple regressions, a criterion variable was predicted from a set of predictors. Forward selection method of multiple regressions was used in this study to find out the predictor variable that has the highest correlation with the criterion variables and it is entered into the equation first. The rest variables are entered into the equation depending on the contribution of each predictor. In all the cases 0.05 level of significance was fixed to test the hypothesis.
The collected data was analyzed by using Pearson and multiple correlation among university women Basketball players on the selected variables and the results were presented below.

**Physical Variables**

The data on selected physical variables for university Basketball players were statistically analyzed by using Pearson product moment and multiple correlation and the results were presented in table III.

**TABLE III**

**MEAN, STANDARD DEVIATION, PEARSON PRODUCT MOMENT AND MULTIPLE CORRELATION OF SELECTED PHYSICAL VARIABLES AND PLAYING ABILITY AMONG UNIVERSITY WOMEN BASKETBALL PLAYERS**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r&lt;sub&gt;12&lt;/sub&gt; value</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Speed</td>
<td>7.835</td>
<td>0.282</td>
<td>0.57*</td>
<td></td>
</tr>
<tr>
<td>2. Grip strength</td>
<td>38.54</td>
<td>4.016</td>
<td>0.46*</td>
<td>0.452*</td>
</tr>
<tr>
<td>3. Agility</td>
<td>11.74</td>
<td>0.401</td>
<td>0.63*</td>
<td></td>
</tr>
<tr>
<td>4. Explosive Power</td>
<td>36.55</td>
<td>2.762</td>
<td>0.47*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 level with df 198 is 0.178.

The table above showed that the Pearson product moment values between the playing ability and speed, grip strength, agility, and leg explosive power of
university women basketball players were greater than the tabulated r value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and speed, grip strength, agility, and leg explosive power of university women basketball players in each variables separately.

The table above also showed that the multiple correlation (R) value between the playing ability and the combined effect of speed, grip strength, agility, and leg explosive power were greater than the tabulated R value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and the combined effect of speed, grip strength, agility, and leg explosive power of university women basketball players.

Pearson Product moment correlation values between the selected physical variables and playing ability were graphically presented in figure I.
FIGURE I: PEARSON PRODUCT MOMENT CORRELATION VALUES BETWEEN THE SELECTED PHYSICAL VARIABLES AND PLAYING ABILITY.
Physiological Variables

The data on selected physiological variables for university Basketball players were statistically analyzed by using Pearson product moment and multiple correlation and the results were presented in table I.

TABLE IV

MEAN, STANDARD DEVIATION, PEARSON PRODUCT MOMENT AND MULTIPLE CORRELATION OF SELECTED PHYSIOLOGICAL VARIABLES AND PLAYING ABILITY AMONG UNIVERSITY WOMEN BASKETBALL

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r_{12} value</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resting Pulse Rate</td>
<td>68.13</td>
<td>1.954</td>
<td>0.50*</td>
<td>0.375*</td>
</tr>
<tr>
<td>2. Breath Holding Time</td>
<td>38.88</td>
<td>2.641</td>
<td>0.49*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 level with df 198 is 0.178.

The table above showed that the Pearson product moment correlation values between the playing ability and resting pulse rate and breath holding time of university women basketball players were greater than the tabulated r value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and resting pulse rate and breath holding time of university women basketball players in each variables separately.
The table above also showed that the multiple correlation (R) value between the playing ability and the combined effect of resting pulse rate and breath holding time were greater than the tabulated R value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and the combined effect of resting pulse rate and breath holding time of university women basketball players.

Pearson Product moment correlation values between the selected physiological variables and playing ability were graphically presented in figure II.
FIGURE II: PEARSON PRODUCT MOMENT CORRELATION VALUES BETWEEN THE SELECTED PHYSIOLOGICAL VARIABLES AND PLAYING ABILITY.
Psychological Variables

The data on selected psychological variables for university Basketball players were statistically analyzed by using Pearson product moment and multiple correlation and the results were presented in table V.

TABLE V

MEAN, STANDARD DEVIATION, PEARSON PRODUCT MOMENT AND MULTIPLE CORRELATION OF SELECTED PSYCHOLOGICAL VARIABLES AND PLAYING ABILITY AMONG UNIVERSITY WOMEN BASKETBALL PLAYERS

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson r₁₂ value</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxiety</td>
<td>51.8</td>
<td>4.187</td>
<td>0.22*</td>
<td></td>
</tr>
<tr>
<td>2. Self-confidence</td>
<td>15.36</td>
<td>2.266</td>
<td>0.27*</td>
<td></td>
</tr>
<tr>
<td>3. Achievement Motivation</td>
<td>25.42</td>
<td>2.949</td>
<td>0.28*</td>
<td>0.21*</td>
</tr>
<tr>
<td>4. Aggression</td>
<td>27.52</td>
<td>3.916</td>
<td>0.26*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 level with df 198 is 0.178.
The table above showed that the Pearson product moment values between the playing ability and anxiety, self-confidence, achievement motivation and aggression of university women basketball players were greater than the tabulated r value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and anxiety, self-confidence, achievement motivation and aggression of university women basketball players in each variables separately.

The table above also showed that the multiple correlation (R) value between the playing ability and the combined effect of anxiety, self-confidence, achievement motivation and aggression were greater than the tabulated R value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and the combined effect of anxiety, self-confidence, achievement motivation and aggression of university women basketball players.

Pearson Product moment correlation values between the selected psychological variables and playing ability were graphically presented in figure III.
FIGURE III: PEARSON PRODUCT MOMENT CORRELATION VALUES BETWEEN THE SELECTED PSYCHOLOGICAL VARIABLES AND PLAYING ABILITY.
Anthropometrical Variables

The data on selected anthropometrical variables for university Basketball players were statistically analyzed by using Pearson product moment and multiple correlation and the results were presented in table VI.

TABLE VI

MEAN, STANDARD DEVIATION, PEARSON PRODUCT MOMENT AND MULTIPLE CORRELATION OF SELECTED ANTHROPOMETRICAL VARIABLES AND PLAYING ABILITY AMONG UNIVERSITY WOMEN BASKETBALL PLAYERS

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson $r_{12}$ value</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Height</td>
<td>1.661</td>
<td>0.03</td>
<td>0.61*</td>
<td></td>
</tr>
<tr>
<td>2. Weight</td>
<td>57.7</td>
<td>4.171</td>
<td>0.19*</td>
<td>0.421*</td>
</tr>
<tr>
<td>3. Arm Length</td>
<td>78.26</td>
<td>3.015</td>
<td>0.65*</td>
<td></td>
</tr>
<tr>
<td>4. Leg Length</td>
<td>88.06</td>
<td>3.217</td>
<td>0.68*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 level with df 28 is 0.361.

The table above showed that the Pearson product moment values between the playing ability and height, weight, arm length and leg length of university women basketball players were greater than the tabulated $r$ value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and height, weight, arm length and leg length of university women basketball players in each variables separately.
The table above also showed that the multiple correlation (R) value between the playing ability and the combined effect of height, weight, arm length and leg length were greater than the tabulated R value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and the combined effect of height, weight, arm length and leg length of university women basketball players.

Pearson Product moment correlation values between the selected anthropometrical variables and playing ability were graphically presented in figure IV.
FIGURE IV: PEARSON PRODUCT MOMENT CORRELATION VALUES BETWEEN THE SELECTED ANTHROPOMETRICAL VARIABLES AND PLAYING ABILITY.
**Performance Variables**

The data on selected performance variables for university Basketball players were statistically analyzed by using Pearson product moment and multiple correlation and the results were presented in table VII.

**TABLE VII**

**MEAN, STANDARD DEVIATION, PEARSON PRODUCT MOMENT AND MULTIPLE CORRELATION OF SELECTED PERFORMANCE VARIABLES AND PLAYING ABILITY AMONG UNIVERSITY WOMEN BASKETBALL PLAYERS**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Pearson $r_{12}$ value</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Passing</td>
<td>22.87</td>
<td>1.181</td>
<td>0.72*</td>
<td></td>
</tr>
<tr>
<td>2. Shooting</td>
<td>25.47</td>
<td>1.523</td>
<td>0.82*</td>
<td>0.541*</td>
</tr>
<tr>
<td>3. Dribbling</td>
<td>11.9</td>
<td>1.027</td>
<td>0.58*</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 level with df 28 is 0.361.

The table above showed that the Pearson product moment values between the playing ability and speed, grip strength, agility, and leg explosive power of university women basketball players were greater than the tabulated $r$ value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and speed, grip strength, agility, and leg explosive power of university women basketball players in each variables separately.
The table above also showed that the multiple correlation (R) value between the playing ability and the combined effect of speed, grip strength, agility, and leg explosive power were greater than the tabulated R value at .05 level of confidence. Therefore, it was concluded that there was significant relationship between playing ability and the combined effect of speed, grip strength, agility, and leg explosive power of university women basketball players.

Pearson Product moment correlation values between the selected performance variables and playing ability were graphically presented in figure V.
FIGURE V: PEARSON PRODUCT MOMENT CORRELATION VALUES BETWEEN THE SELECTED PERFORMANCE VARIABLES AND PLAYING ABILITY.
Prediction

Multiple regression equation was computed only if the multiple correlations are sufficiently high to warrant prediction from it. Then, the correlation identifies the independent variables to be included and their order in the regression equation. Multiple correlations were computed by forward selection method on data obtained for university women basketball players and the results were presented in table VIII.

TABLE VIII

MULTIPLE CORRELATION COEFFICIENTS FOR THE PREDICTORS OF PLAYING ABILITY OF UNIVERSITY WOMEN BASKETBALL PLAYERS

<table>
<thead>
<tr>
<th>S. No</th>
<th>Variables (Forward Selection)</th>
<th>R</th>
<th>R Square</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speed</td>
<td>0.67</td>
<td>0.44</td>
<td>0.44</td>
</tr>
<tr>
<td>2</td>
<td>Speed &amp; Explosive power</td>
<td>0.68</td>
<td>0.46</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>Speed, Explosive power &amp; Height</td>
<td>0.69</td>
<td>0.48</td>
<td>0.01</td>
</tr>
<tr>
<td>4</td>
<td>Speed, Explosive power, Height &amp; Grip strength</td>
<td>0.72</td>
<td>0.52</td>
<td>0.04</td>
</tr>
<tr>
<td>5</td>
<td>Speed, Explosive power, Height, Grip strength &amp; Shooting</td>
<td>0.76</td>
<td>0.58</td>
<td>0.06</td>
</tr>
</tbody>
</table>
From the table IV, it was found that the multiple correlation coefficients for predictors such as speed, explosive power, height, grip strength and shooting is 0.76 which produce highest multiple correlations with basketball playing ability of university women players. R square values showed that the percentage of contribution of predictors to the playing ability (dependent variable) in the following order.

1. About 44% of the variation in the playing ability was explained by the regression model with one predictor speed.

2. About 46% of the variation in the playing ability was explained by the regression model with two predictors, speed and explosive power. An additional 2% of the variance in the playing ability is contributed by explosive power.

3. About 48% of the variation in the playing ability was explained by the regression model with three predictors, speed, explosive power and height. An additional 1% of the variance in the playing ability is contributed by height.

4. About 52% of the variation in the playing ability was explained by the regression model with four predictors, speed, explosive power, height and grip strength. An additional 4% of the variance in the playing ability is contributed by grip strength.

5. About 58% of the variation in the playing ability was explained by the regression model with five predictors, speed, explosive power, height, grip
strength and shooting. An additional 6% of the variance in the playing ability is contributed by shooting.

The regression equation for the prediction of basketball playing ability of university women player includes speed, explosive power, height, grip strength and shooting. As the multiple correlations on playing ability with the combined effect of these independent variables are highly significant, it is apparent that the regression equation has a high predictive validity. Thus, this equation may be successfully utilized in selecting university basketball players.

**Discussion on Findings**

The performance of basketball has been regularly influenced to a great extent by skills, physical ability, anthropometric variables and psychological variables. In the modern basketball game, power, agility, speed, strength and rudiments of game have been over emphasized to gain ball control in offense and defense at any level of competition. Each player is necessarily required to be continuously on the move over a certain period of time. This puts a great deal of demand in terms of potential physical efforts on the part of each player on the playing field.

In basketball dynamic physical adaptation patterns are of immense importance. The real achievement needs supreme proficiency level in all ingredients (skills) of the game. The mastery over handling the ball, height, explosive power, speed and skill against opponent and rhythmical display of all
possible elements of the game are determining factors to win the game in one’s own favour.

Therefore, the significant relationship between playing ability and all the selected skills, physical, physiological, psychological, anthropometric and performance variables at the interuniversity level of achievement and proficiency may be justified as follows.

The analysis of data for university women basketball players reveals that when an attempt is made to identify those variables which have predicted influence as in basketball playing ability. Basketball playing ability is predicted from speed, explosive power, height, grip strength and shooting as the variables which produce the highest multiple correlation with basketball playing ability. Obviously these variables need to be given special attention while preparing players for university level competitions. Training schedules at this level should include separate training units of each of these variables.

Thus, the investigation clearly points out that the basketball playing ability is mostly based on the physical performance variables (first), anthropometrical and skill components of the players (next) and lastly, it depends upon the physiological and psychological variables. The psychological factors too contribute significantly for the playing ability of the basketball. However, it finds the fourth place.

The results of the present study indicate that speed, explosive power, height, grip strength and shooting are playing an important role at university level
basketball performance, whereas other selected variables do not have much significant role in the performance.

**Discussion on Hypotheses**

In the beginning of the study it was hypothesized that there would be a significant relationship between the Basketball playing ability and selected physical variables. The results of the study produced significant relationship on selected physical variables. Hence, the researcher’s first hypothesis was accepted.

In second hypothesis, it was hypothesized that there would be a significant relationship between the Basketball playing ability and selected physiological variables. The results of the study produced significant relationship on selected physiological variables. Hence, the researcher’s second hypothesis was accepted.

In third hypothesis, it was hypothesized that there would be a significant relationship between the Basketball playing ability and selected psychological variables. The results of the study produced insignificant relationship on selected psychological variables. Hence, the researcher’s third hypothesis was rejected.

In fourth hypothesis, it was hypothesized that there would be a significant relationship between the Basketball playing ability and selected anthropometrical variables. The results of the study produced significant relationship on selected anthropometrical variables except weight. Hence, the researcher’s fourth hypothesis was partially accepted.

In fifth hypothesis, it was hypothesized that there would be a significant relationship between the Basketball playing ability and selected performance
variables. The results of the study produced significant relationship on selected performance variables. Hence, the researcher’s fifth hypothesis was accepted.

The regression equation for the prediction of basketball playing ability for university women basketball players includes speed, explosive power, height, grip strength and shooting. As the multiple correlation of basketball playing ability with the combined effect of these independent variables is highly significant (R=0.76) it is apparent that the obtained regression equation has a high predictive validity statistically. Thus the equation may be successfully utilized in selecting intercollegiate players. Hence, the researcher’s sixth hypothesis was accepted.