CHAPTER-IV

ANALYSIS AND INTERPRETATION OF DATA
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The main purpose of the study was to find the relationship between the Physiological, Coordinative and Psychomotor Variables to the performance of Volley Ball Players. The data was collected from 100 North Zone Inter University male Volley Ball Players, is presented in this chapter. The data of all the three variables was calculated to find the relationship with Volley Ball performance. To know the relationship in the selected variables Rank order, Partial co-relation and Multiple co-relation Test were applied.

I. COORDINATIVE ABILITY

The composite score of all the five coordinative abilities (Orientation ability, Reaction ability, Differentiation ability, Balance ability, Rhythm ability) along with number and performance score are given.

4.1 TABLES SHOWING COORDINATIVE ABILITY IN RELATION TO THE PERFORMANCE IN VOLLEY BALL
1. **Orientation Ability**

   **Table 4.1.1**

   **Spearmen Rank Co-relation of Performance in Volleyball in Relation to Orientation Ability**

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Orientation Ability</th>
<th>d</th>
<th>d²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>868.5</td>
<td>4143.5</td>
<td>254732</td>
</tr>
</tbody>
</table>

   Level of Significance 0.5
   * Significant at 0.5 level
   Table Value at 0.5 = 0.1654
   \[ r_s = 0.52^* \]

   Table 4.1.1 shows the performance score and orientation ability score i.e. (5011.5) and 868.5 respectively. The calculated value \( r_s = 0.52 \) is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

II. **Differentiation ability**

   **Table 4.1.2**

   **Spearmen Rank Co-relation of Performance in Volleyball in Relation to Differentiation Ability**

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Differentiation Ability</th>
<th>d</th>
<th>d²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>1300</td>
<td>3711.5</td>
<td>217097.8</td>
</tr>
</tbody>
</table>

   Level of Significance 0.5
   * Significant at 0.5 level
   Table Value 0.5 = 0.1654
   \[ r_s = 0.30^* \]
Table 4.1.2 gives us the picture of the performance score and differentiation ability score i.e. (5011.5) and 1300 respectively. The calculated value $r_s = 0.30$ is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman's rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

III. Reaction Ability

Table 4.1.3

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Reaction Ability</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>168.9</td>
<td>4842.59</td>
<td>319480.8</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654 $r_s = 0.91^*$

Table 4.1.3 is showing the performance score and Reaction Ability score i.e. (5011.5) and 168.9 respectively. The calculated value $r_s = 0.91$ is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman's rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.
IV. Balance Ability

Table 4.1.4

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Balance Ability

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Balance ability</th>
<th>d</th>
<th>d^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>932.21</td>
<td>4079.29</td>
<td>249981.3</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

The calculated value r_s=0.38 is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

V. Rhythm Ability

Table 4.1.5

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Rhythm Ability

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Rhythm ability</th>
<th>d</th>
<th>d^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>80.19</td>
<td>4931.31</td>
<td>328075.83</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

r_s=0.96*
Table 4.1.5 demonstrate the performance score and Rhythm ability score i.e. (5011.5) and 80.19 respectively. The calculated value $r_s=0.96$ is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

4.2 TABLE SHOWING RELATION OF COMPOSITE SCORE COORDINATIVE ABILITY TO THE PERFORMANCE IN VOLLEY BALL

The composite score of all the five coordinative abilities (Orientation ability, Reaction ability, Differentiation ability, Balance ability, Rhythm ability) along with number and performance score are given in table 4.1.6.

Table 4.1.6

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Composite Score</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>5054</td>
<td>-42.5</td>
<td>80064.25</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654
$r_s=0.51^*$

Table 4.1.6 illustrate the performance ranking, composite score of all five variables of coordinative ability is (5011.5) and composite score (5054) respectively.
The calculated value $rs=0.51$ is higher than table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.05 level.

Hence, Hypothesis No 1 that, “there will be no significant relationship of selected coordinative abilities to the performance in Volley ball” is rejected.

II. PSYCHOMOTOR ABILITY

4.3 TABLES SHOWING PSYCHOMOTOR ABILITY IN RELATION TO THE PERFORMANCE IN VOLLEY BALL

i Speed

Table 4.2.1
Spearmen Rank Co-relation of Performance in Volleyball in Relation to Speed

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Speed</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>643</td>
<td>4368.5</td>
<td>275288.9</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

$rs=0.65^*$

Table 4.2.1 illustrate the performance score and Speed score i.e. (5011.5) and 643 respectively. The calculated value $rs=0.65$ is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.
### ii Agility

**Table 4.2.2**

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Agility

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Agility</th>
<th>d</th>
<th>d^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>1020.87</td>
<td>3990.63</td>
<td>244014.6</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

Table 4.2.2 depicts the performance score and Agility score i.e. (5011.5) and 1020.87 respectively. The calculated value \( r_s = 0.46 \) is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman's rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

### iii Speed of Movement

**Table 4.2.3**

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Speed of Movement

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Speed of Movement</th>
<th>d</th>
<th>d^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>3383.5</td>
<td>1628</td>
<td>107990.5</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
Table Value 0.5 = 0.1654

\( r_s = -0.35 \)
Table 4.2.3 shows the performance score and Speed of Movement score i.e. (5011.5) and 3383.5 respectively. The calculated value $r_s = -0.35$ is lower than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is not significant at 0.5 level.

iv Response Time

Table 4.2.4
Spearmen Rank Co-relation of Performance in Volleyball in Relation to Response Time

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Response Time</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>219.09</td>
<td>4792.41</td>
<td>313792.6</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

$r_s = 0.88^*$

Table 4.2.4 showing the performance score and Response Time score i.e. (5011.5) and 219.09 respectively. The calculated value $r_s = 0.88$ is higher than the table value (0.1654) so we conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.
4.4 TABLE SHOWING RELATIONSHIP OF COMPOSITE SCORE OF PSYCHOMOTOR ABILITY TO THE PERFORMANCE IN VOLLEY BALL

The composite score of all the Four Psychomotor abilities (Speed, Agility, Speed of movement, Response time) along with number and performance score are given in table 4.2.5.

Table 4.2.5
Spearmen Rank Co-relation of Performance in Volleyball in relation to Composite Score of Psychomotor ability

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Composite score</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>5237.5</td>
<td>-225.96</td>
<td>88600</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654 $r_s=0.46^*$

Table 4.2.5 gives us the picture of the performance ranking, composite score of all four variables of psychomotor ability is (5011.5) and composite score (5237.5) respectively.

The calculated value $r_s=0.46$ is higher than table value (0.1654) at 0.5 significance. So we can conclude that our spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.05 level.
Hence, Hypothesis No 2 that, “there will be no significant relationship of selected psychomotor abilities to the performance in volley ball” is rejected.

III. PHYSIOLOGICAL ABILITY

4.5 TABLE SHOWING OF PHYSIOLOGICAL ABILITY IN RELATION TO THE PERFORMANCE IN VOLLEY BALL

i Body Mass Index

Table 4.3.1

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Body Mass Index</th>
<th>d</th>
<th>d²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>2174.6</td>
<td>2836.9</td>
<td>162751.8</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
Table Value 0.5 = 0.1654

rs = -0.023

Table 4.3.1 illustrate the performance score and Body Mass Index i.e. (5011.5) and 2174.6 respectively. The calculated value rs = -0.023 is lower than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is not significant at 0.5 level.
Table 4.3.2

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Vo2 Max

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Vo2 Max</th>
<th>d</th>
<th>d²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>4956.7</td>
<td>-54.85</td>
<td>79086.43</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
Table Value 0.5 = 0.1654

Table 4.3.2 depicts the performance score and Vo2 Max Score i.e. (5011.5) and 4956.7 respectively. The calculated value rs= -0.52 is lower than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman's rank correlation coefficient is statically different from zero. Therefore it is not significant at 0.5 level.

Table 4.3.3

Spearmen Rank Co-relation of Performance in Volleyball in Relation to Vital Capacity

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Vital Capacity</th>
<th>d</th>
<th>d²</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>395.55</td>
<td>4615.95</td>
<td>297142.8</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
* Significant at 0.5 level
Table Value 0.5 = 0.1654

rs=0.78*
Table 4.3.3 gives us the picture of performance score and Vital Capacity i.e. (5011.5) and 395.55 respectively. The calculated value $r_s= 0.78$ is higher than the table value (0.1654) at 0.5 level of significance. So we can conclude that our Spearman’s rank correlation coefficient is statically different from zero. Therefore it is significant at 0.5 level.

4.6 TABLE SHOWING COMPOSITE SCORE OF PHYSIOLOGICAL ABILITY TO THE PERFORMANCE IN VOLLEY BALL

The composite score of all the Three Physiological abilities (BMI, Vo2 max, Vital capacity) along with number and performance score are given in table 4.3.4.

Table 4.3.4

<table>
<thead>
<tr>
<th>Performance score</th>
<th>Composite score</th>
<th>d</th>
<th>$d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>7526.8</td>
<td>-2515.3</td>
<td>141062.6</td>
</tr>
</tbody>
</table>

Level of Significance 0.5
Table Value at 0.5=0.1654 $r_s =0.15$

Table 4.3.4 shows the performance ranking, composite score of all three variables of Physiological ability is (5011.5) and composite score (7526.8) respectively.
The calculated value $r_s=0.15$ is higher than table value (0.1654) at 0.5 level of significance. So we can conclude that our spearman’s rank correlation coefficient is statically different from zero. Therefore it is not significant at 0.05 level.

Hence, Hypothesis No 3 that, “there will be no significant relationship of selected physiological abilities to the performance in volley ball” is accepted.

### 4.7 TABLES SHOWING PARTIAL RELATIONSHIP OF VOLLEY BALL PERFORMANCE BETWEEN TWO OF THE THREE VARIABLES

The composite score of the two variables i.e. Coordinative abilities and Psychomotor abilities, along with number and performance score are given in table 4.4.

**Table 4.4**

Partial co-relation of performance in volleyball in relation to composite score of Coordinative ability and Psychomotor ability

<table>
<thead>
<tr>
<th>Composite score(coor) (r1)</th>
<th>Composite score (psy) (r2)</th>
<th>Performance (r3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5054</td>
<td>5237.46</td>
<td>5011.5</td>
</tr>
</tbody>
</table>

$r_{123}=-0.32$
Table 4.4 shows the performance ranking, composite score of the two variables i.e. coordinative ability and Psychomotor ability is (5011.5), composite score (5054) and (5237.46) respectively.

The calculated value \( r_{12.3} = -0.32 \) the correlation between 1\(^{st}\) and 2\(^{nd}\) variable is negative and 3\(^{rd}\) variable has no effect as it is constant.

Hence, Hypothesis No 4 that, "there will be no significant partial relationship of volleyball performance between the two of the three variables" is accepted.

### 4.8 TABLES SHOWING MULTIPLE CO-RELATIONS BETWEEN VOLLEY BALL PERFORMANCE AND ALL OF THE THREE VARIABLES

The composite score of all the three variables i.e. Coordinative ability, Psychomotor abilities and Physiological abilities along with number and performance score are given in table 4.5.

#### Table 4.5

<table>
<thead>
<tr>
<th>Performance score ( r_1 )</th>
<th>Composite score(coor) ( r_2 )</th>
<th>Composite score(psy) ( r_3 )</th>
<th>Composite score(phy) ( r_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>5011.5</td>
<td>5054</td>
<td>5237.46</td>
<td>7526.8</td>
</tr>
</tbody>
</table>

\( R_{x1(x2, x3, x4)} = 0.61 \)
Table 4.5 gives us the picture of the performance ranking, composite score of the three variables i.e. coordinative ability, Physiological ability and Psychomotor ability is (5011.5) and composite score (5054),(5237.46),(7526.8) respectively.

The calculated value $R_{x1(x2, x3, x4)} = 0.61$

Hence, Hypothesis No 5 that, “there will be no significant multiple co-relation between volley ball performance and composite score of all the three variables” is accepted.

**Findings**

In order to find out the relationship between the coordinative abilities Physiological variables and Psychomotor abilities to the performance of Volley ball Players, the collected data was calculated by using Spearman’s Rank Correlation, Partial Correlation and Multiple Correlation.

In coordinative ability, it is evident from Table 4.1.1 to 4.1.6 that the result obtained was significant as the calculated value (0.51) is higher than the table value (0.1654) at 0.5 levels of significance.

In the case of Psychomotor Ability (Table 4.2.1 to 4.2.5) the similar result was obtained as the calculated value (0.46) was higher than the table value (0.1654) at 0.5 level of significance.
In the case of Physiological ability (Table 4.3.1 to 4.3.4) result obtained was insignificant as the calculated value (0.15) was less than table value (0.1654) at 0.5 level of significance.

**Discussion on Findings**

Finding of the present study showed that there was significant relationship between the selected coordinative abilities, Psychomotor abilities to the performance of Volley ball players but there was no significant relationship between Physiological abilities to the performance of Volley Ball players.

In the post studies conducted by some other scholar also support the findings of present study because they were also having significant relationship. But at the same time the findings of the same studies also disgrace with the findings and having no significant relationship between selected abilities and performance.

**Discussion of Hypothesis**

On the basis of the results of the study, the 1st hypothesis stated that there would be no significant relationship between the selected coordinative abilities to the performance in Volley ball is rejected at .05 level of significance.

On the basis of the results of the study, the II\(^{nd}\) hypothesis stated that there would be no significant relationship between the selected Psychomotor abilities to
the performance in Volley ball is rejected at .05 level of significance.

On the basis of the results of the study, the III\textsuperscript{rd} hypothesis stated that there would be no significant relationship between the selected Physiological abilities to the performance in Volley ball is accepted at .05 level of significance.

On the basis of the results of the study, the IV\textsuperscript{th} hypothesis stated that there would be no significant partial relationship of Volleyball performance between two of the three variables is accepted.

On the basis of the results of the study, the V\textsuperscript{th} hypothesis stated that there would be no significant multiple co-relation between Volley ball performance and composite score of all the three variables is accepted.