

## CHAPTER – IV

### ANALYSIS AND INTERPRETATION OF DATA

In general data may be valid, reliable and adequate but they do not serve any useful purpose unless they are carefully processed, systematically shifted, classified, tabulated, scientifically analyzed intelligently interpreted and rationally concluded. After data have been collected, they are analyzed using uni-variate and discriminate analysis.

#### **4.1. Level of significance**

To test the formulated hypothesis in the present study, as level of significance, 0.05 level was chosen and considered as sufficient.

#### **4.2. Results**

The results derived by comparing the psychosociological status among the positional play of hockey players (forward, midfield and fullback) are explained from table 4.1 to 4.30.

**Table 4.1 Descriptive statistics on focus**

| Variable | Positions | Mean  | Standard Deviation |
|----------|-----------|-------|--------------------|
| Focus    | Forward   | 14.35 | 2.21               |
|          | Mid field | 13.45 | 2.05               |
|          | Fullback  | 14.68 | 2.13               |

Table 4.1 shows the descriptive measures on focus of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 14.35, 2.21 (forward), 13.45, 2.05 (midfield) and 14.68, 2.13(fullback).

**Table 4.2 Analysis of Variance on Focus among the Forward, Mid-filed and Fullback Hockey Players**

| Variable | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|----------|---------------------|----------------|--------------------|-------------|---------|
| Focus    | Between Groups      | 32.64          | 2.00               | 16.32       | 3.59*   |
|          | Within Groups       | 559.33         | 123.00             | 4.55        |         |
|          | Total               | 591.97         | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.2 reveals that the obtained 'F' value was 3.59. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (3.59) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and fullback hockey Players on focus is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for such a significant mean difference as pos-hoc test, Bonferroni test was applied. The results of this are given in the table 4.3 as follows.

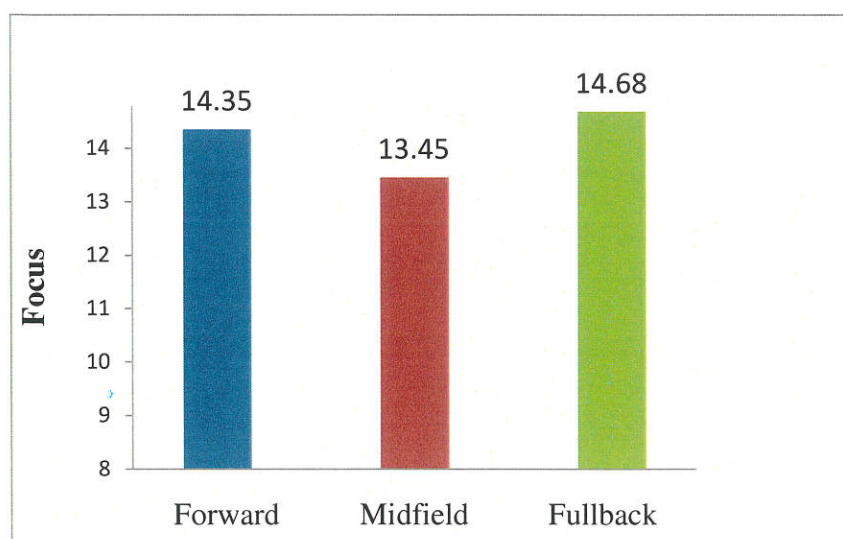
**Table 4.3 Bonferroni Post-hoc test on focus**

| <b>Forward</b> | <b>Mid-field</b> | <b>Fullback</b> | <b>Mean Difference</b> | <b>Sig.</b> |
|----------------|------------------|-----------------|------------------------|-------------|
| 14.35          | 13.45            | ----            | 0.90                   | 0.14        |
| 14.35          | ----             | 14.68           | 0.32                   | 1.00        |
| ----           | 13.45            | 14.68           | 1.22                   | 0.04*       |

\*Significant at 0.05 level

The results (table 4.3) of Bonferroni test explained that significant mean difference was exist between the pair of mid field and fullback positional play. Besides it was observed that hockey players pertaining to fullback where found to be higher performance in focus (14.68) compared to midfield of hockey players (13.45). Further when comparing the mean differences existing between the remaining pairs of forward versus midfield and forward versus fullback the mean difference exists was found as statistically not significant as far as the performance of focus is concerned.

**Figure: 1 Bar diagram shows the mean values on focus**



**Table 4.4 Descriptive statistics on Self-confidence**

| Variable        | Positions | Mean  | Standard Deviation |
|-----------------|-----------|-------|--------------------|
| Self-confidence | Forward   | 12.58 | 1.92               |
|                 | Mid field | 14.27 | 5.11               |
|                 | Fullback  | 12.44 | 1.94               |

Table 4.4 shows the descriptive measures on self-confidence of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 12.58, 1.92 (forward), 14.27, 5.11 (midfield) and 12.44, 1.94 (fullback).

**Table 4.5 Analysis of Variance on Self-confidence among the Forward, Mid-filed and Fullback Hockey Players**

| Variable        | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|-----------------|---------------------|----------------|--------------------|-------------|---------|
| Self confidence | Between Groups      | 87.93          | 2.00               | 43.97       | 3.80*   |
|                 | Within Groups       | 1422.78        | 123.00             | 11.57       |         |
|                 | Total               | 1510.71        | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.5 reveals that the obtained 'F' value was 3.80. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F value (3.80) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on self-confidence is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.6 as follows.



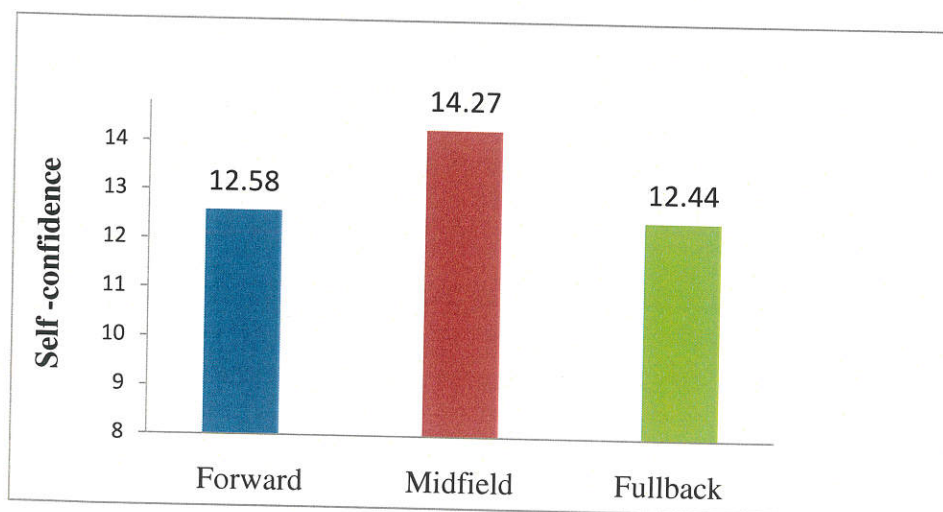
**Table 4.6 Bonferroni Post-hoc test on self-confidence**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 12.58   | 14.27     | ----     | 1.69            | 0.05* |
| 12.58   | ----      | 12.44    | 0.14            | 1.00  |
| ----    | 14.27     | 12.44    | 1.83            | 0.05* |

\*Significant at 0.05 level

The results (table 4.6) of Bonferroni test explained that significant mean difference was exists between the pairs of forward and mid field, mid field and fullback. Besides, it was observed that hockey players pertaining to mid field were found to be higher performance in self-confidence (14.27) have compared to forward and fullback of hockey players (12.58 and 12.44). Further when comparing the mean differences existing between the remaining pair of forward Vs fullback the mean difference exists was found as statistically not significant as far as the performance of self-confidence is concerned.

**Figure: 2 Bar diagram shows the mean values on self-confidence**



**Table 4.7 Descriptive statistics on Competitive desire**

| Variable           | Positions | Mean  | Standard Deviation |
|--------------------|-----------|-------|--------------------|
| Competitive desire | Forward   | 12.33 | 1.86               |
|                    | Mid field | 11.11 | 1.40               |
|                    | Fullback  | 13.76 | 2.06               |

Table 4.7 shows the descriptive measures on competitive stress of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 12.33, 1.86 (forward), 11.11, 1.40 (midfield) and 13.76, 2.06 (fullback).

**Table 4.8 Analysis of Variance on Competitive desire among the Forward, Mid-filed and Full back Hockey Players**

| Variable           | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|--------------------|---------------------|----------------|--------------------|-------------|---------|
| Competitive desire | Between Groups      | 134.92         | 2.00               | 67.46       | 21.43*  |
|                    | Within Groups       | 387.22         | 123.00             | 3.15        |         |
|                    | Total               | 522.13         | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.8 reveals that the obtained 'F' value was 21.43. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F value (21.43) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on competitive desire is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.9 as follows:

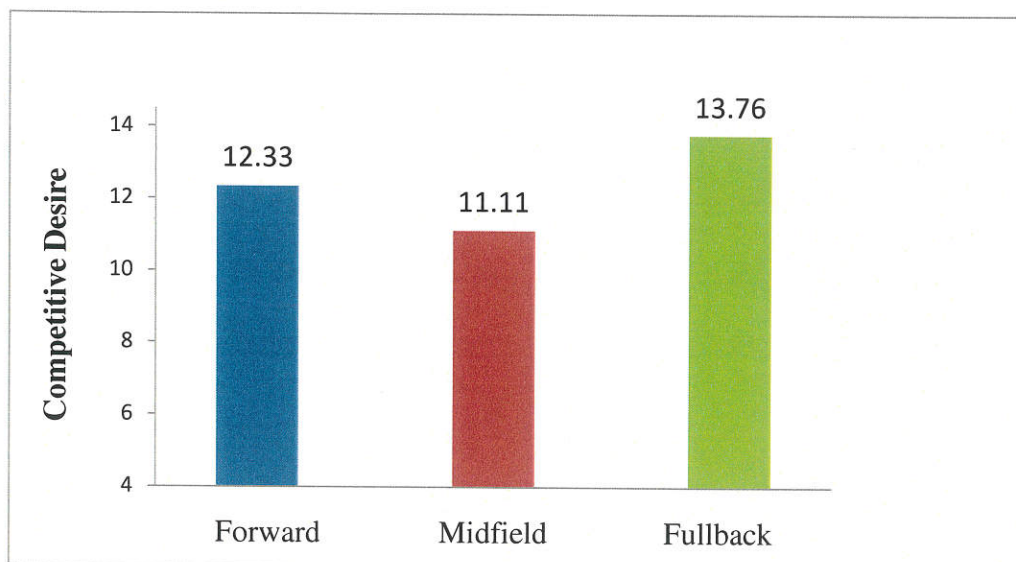
**Table 4.9 Bonferroni Post-hoc test on competitive desire**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 12.33   | 11.11     | ----     | 1.22            | 0.00* |
| 12.33   | ----      | 13.76    | 1.43            | 0.00* |
| ----    | 11.11     | 13.76    | 2.65            | 0.00* |

\*Significant at 0.05 level

The results (table 4.9) of Bonferroni test explained that significant mean difference was exists between the pairs of forward and mid field, forward and fullback and mid field and fullback. Besides it was observed that hockey players pertaining to fullback were found to be higher performance in competitive desire (13.76) have compared to forward and midfield of hockey players (12.33 and 11.11). The mean difference exists was found as statistically significant as far as the performance of competitive desire is concerned.

**Figure: 3 Bar diagram shows the mean values on competitive desire**



**Table 4.10 Descriptive statistics on Resilience**

| Variable   | Positions | Mean  | Standard Deviation |
|------------|-----------|-------|--------------------|
| Resilience | Forward   | 16.48 | 1.50               |
|            | Mid field | 15.20 | 2.79               |
|            | Fullback  | 15.29 | 1.78               |

Table 4.10 shows the descriptive measures on resilience of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 16.48, 1.50 (forward), 15.20, 2.79 (midfield) and 15.29, 1.78 (fullback).

**Table 4.11 Analysis of Variance on Resilience among the Forward, Mid-filed and Full back Hockey Players**

| Variable   | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|------------|---------------------|----------------|--------------------|-------------|---------|
| Resilience | Between Groups      | 45.52          | 2.00               | 22.76       | 5.13*   |
|            | Within Groups       | 546.20         | 123.00             | 4.44        |         |
|            | Total               | 591.71         | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.11 reveals that the obtained 'F' value was 5.13. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (5.13) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on resilience is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.12 as follows.

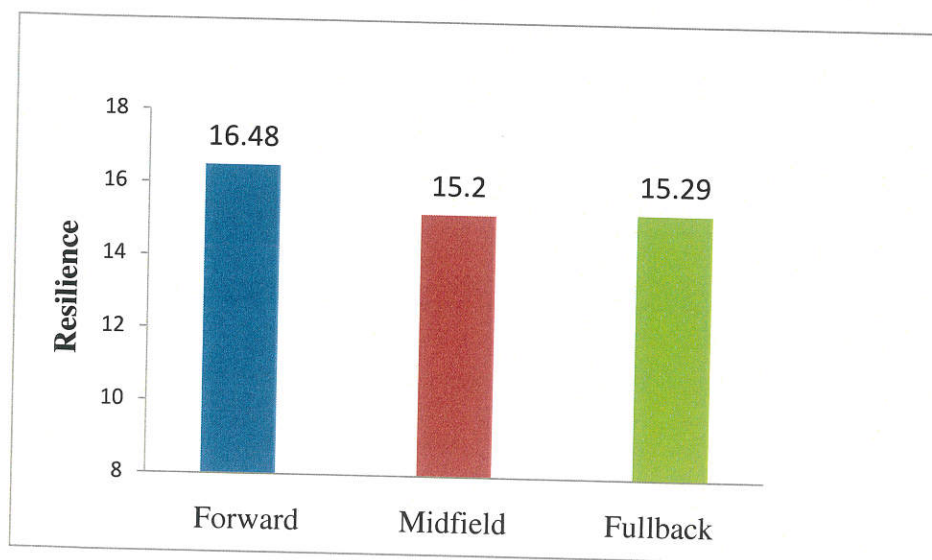
**Table 4.12 Bonferroni Post-hoc test on Resilience**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 16.48   | 15.20     | ----     | 1.27            | 0.01* |
| 16.48   | ----      | 15.29    | 1.19            | 0.04* |
| ----    | 15.20     | 15.29    | 0.09            | 1.00  |

\*Significant at 0.05 level

The results (table 4.12) of Bonferroni test explained that significant mean difference was exists between the pairs of forward and mid field, forward and fullback. Besides it was observed that hockey players pertaining to forward were found to be higher performance in resilience (16.48) have compared to midfield and full back of hockey players (15.20 and 15.29). Further when comparing the mean differences existing between the remaining pair of midfield Vs fullback the mean difference exists was found as statistically not significant as far as the performance of resilience is concerned.

**Figure: 4 Bar diagram shows the mean values on resilience**





**Table 4.13 Descriptive statistics on General fear**

| Variable     | Positions | Mean  | Standard Deviation |
|--------------|-----------|-------|--------------------|
| General fear | Forward   | 57.60 | 10.99              |
|              | Mid field | 53.02 | 11.49              |
|              | Fullback  | 50.62 | 8.62               |

Table 4.13 shows the descriptive measures on general fear of hockey players pertaining to varied positions namely forward, mid-field and fullback is as follows. The mean and standard deviation are: 57.60, 10.99 (forward), 53.02, 11.49 (midfield) and 50.62, 8.62 (fullback).

**Table 4.14 Analysis of Variance on General fear among the Forward, Mid-filed and Full back Hockey Players**

| Variable     | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|--------------|---------------------|----------------|--------------------|-------------|---------|
| General fear | Between Groups      | 1052.73        | 2.00               | 526.36      | 4.69*   |
|              | Within Groups       | 13798.49       | 123.00             | 112.18      |         |
|              | Total               | 14851.21       | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.14 reveals that the obtained 'F' value was 4.69. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (4.69) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on general fear is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.15 as follows.

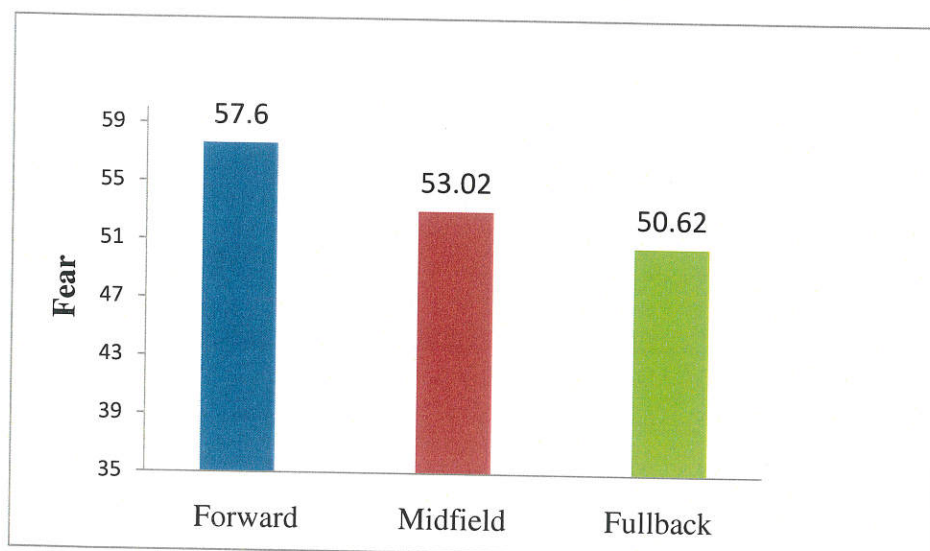
**Table 4.15 Bonferroni Post-hoc test on General fear**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 57.60   | 53.02     | ----     | 4.58            | 0.12  |
| 57.60   | ----      | 50.62    | 6.98            | 0.01* |
| ----    | 53.02     | 50.62    | 2.40            | 0.97  |

\*Significant at 0.05 level

The results (table 4.15) of Bonferroni test explained that significant mean difference was exists between the pair of forward and fullback. Besides it was observed that hockey players pertaining to forward were found to be higher performance in general fear (57.60) have compared to fullback of hockey players (50.62). Further when comparing the mean differences existing between the remaining pairs of forward Vs fullback and mid field Vs fullback the mean difference exists was found as statistically not significant as far as the performance of general fear is concerned.

**Figure: 5 Bar diagram shows the mean values on general fear**





**Table 4.16 Descriptive statistics on Competitive anxiety**

| Variable            | Positions | Mean  | Standard Deviation |
|---------------------|-----------|-------|--------------------|
| Competitive anxiety | Forward   | 20.27 | 2.16               |
|                     | Mid field | 17.09 | 2.57               |
|                     | Fullback  | 19.70 | 2.55               |

Table 4.16 shows the descriptive measures on competitive anxiety of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 20.27, 2.16 (forward), 17.09, 2.57 (midfield) and 19.70, 2.55 (fullback).

**Table 4.17 Analysis of Variance on competitive anxiety among the Forward, Mid-filed and Full back Hockey Players**

| Variable            | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|---------------------|---------------------|----------------|--------------------|-------------|---------|
| Competitive anxiety | Between Groups      | 345.51         | 2.00               | 172.75      | 31.60*  |
|                     | Within Groups       | 672.36         | 123.00             | 5.46        |         |
|                     | Total               | 1017.87        | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.17 reveals that the obtained 'F' value was 31.60. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F value (31.60) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on competitive anxiety is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.18 as follows.

**Table 4.18 Bonferroni Post-hoc test on Competitive anxiety**

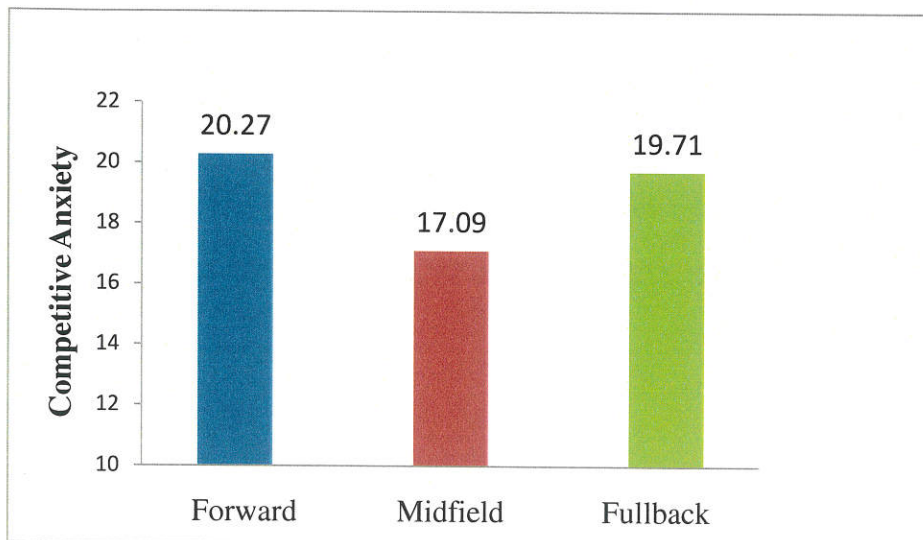
| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 20.27   | 17.09     | ----     | 3.82            | 0.00* |
| 20.27   | ----      | 19.70    | 1.21            | 0.68  |
| ----    | 17.09     | 19.70    | 2.62            | 0.00* |

\*Significant at 0.05 level

The results (table 4.18) of Bonferroni test explained that significant mean difference was exists between the pairs of forward and mid field, mid field and fullback. Besides it was observed that hockey players pertaining to forward were found to be higher performance in competitive anxiety (20.27) have compared to fullback and midfield of hockey players (19.70 and 17.09). Further when comparing the mean differences existing between the remaining pair of forward vs fullback the mean difference exists was found as statistically not significant as far as the performance of competitive anxiety is concerned.

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**Figure: 6 Bar diagram shows the mean values on competitive anxiety**



**Table 4.19 Descriptive statistics on Extroversion introversion**

| Variable                  | Positions | Mean  | Standard Deviation |
|---------------------------|-----------|-------|--------------------|
| Extroversion Introversion | Forward   | 11.85 | 1.69               |
|                           | Mid field | 15.39 | 3.19               |
|                           | Fullback  | 13.71 | 2.52               |

Table 4.19 shows the descriptive measures mean for extroversion introversion of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 11.85, 1.69 (forward), 15.39, and 3.19 (mid-field) and 13.71, 2.52 (fullback).

**Table 4.20 Analysis of Variance on Extroversion- Introversion among the Forward, Mid-filed and full back Hockey Players**

| Variable                  | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Squares | F-ratio |
|---------------------------|---------------------|----------------|--------------------|--------------|---------|
| Extroversion Introversion | Between Groups      | 287.07         | 2.00               | 143.53       | 22.59*  |
|                           | Within Groups       | 781.47         | 123.00             | 6.35         |         |
|                           | Total               | 1068.54        | 125.00             |              |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.20 displays that the obtained 'F' value was 22.59. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (22.59) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on extroversion introversion is statistically significant. Following the results of significant mean difference among the varied positions of hockey players (forward, midfield and full back), to find out the group which is the source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.21 as follows.

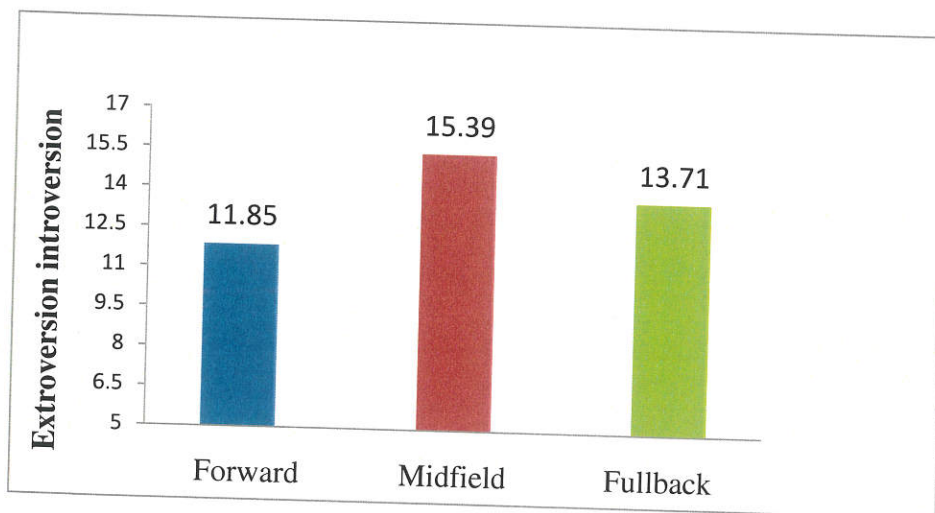
**Table 4.21 Bonferroni Post-hoc test on Extroversion introversion**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 11.85   | 15.39     | ----     | 3.54            | 0.00* |
| 11.85   | ----      | 13.71    | 1.86            | 0.00* |
| ----    | 15.39     | 13.71    | 1.68            | 0.01* |

\*Significant at 0.05 level

The results (table 4.21) of Bonferroni test explained that significant mean difference exists between the pairs of forward and mid field, forward and fullback and mid field and fullback. Besides it was observed that hockey players pertaining to mid filed were found to be higher performance in extroversion introversion (15.39) have compared to forward and fullback of hockey players (11.85 and 13.71). The mean difference exists was found as statistically significant as far as the performance of competitive desire is concerned.

**Figure: 7 Bar diagram shows the mean values on extroversion introversion**



**Table 4.22 Descriptive statistics on Neuroticism stability**

| Variable              | Positions | Mean  | Standard Deviation |
|-----------------------|-----------|-------|--------------------|
| Neuroticism stability | Forward   | 12.96 | 2.26               |
|                       | Mid field | 17.02 | 2.77               |
|                       | Fullback  | 12.74 | 2.93               |

Table 4.22 shows the descriptive measures on neuroticism stability of hockey players pertaining to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 12.96, 2.26 (forward), 17.02, 2.77 (midfield) and 12.74, 2.93 (fullback).

**Table 4.23 Analysis of Variance on neuroticism stability among the Forward, Mid-filed and Full back Hockey Players**

| Variable              | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|-----------------------|---------------------|----------------|--------------------|-------------|---------|
| Neuroticism stability | Between Groups      | 495.79         | 2.00               | 247.90      | 35.72*  |
|                       | Within Groups       | 853.51         | 123.00             | 6.94        |         |
|                       | Total               | 1349.30        | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.23 reveals that the obtained 'F' value was 35.72. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (35.72) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on neuroticism stability is statistically significant. Following are the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.24 as follows.



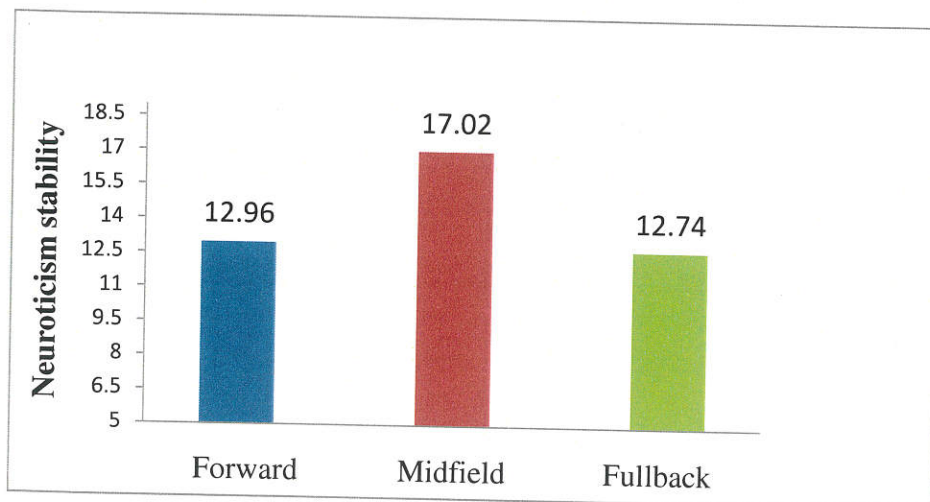
**Table 4.24 Bonferroni Post-hoc test on Neuroticism stability**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 12.96   | 17.02     | ----     | -4.06           | 0.00* |
| 12.96   | ----      | 12.74    | 0.22            | 1.00  |
| ----    | 17.02     | 12.74    | 4.28            | 0.00* |

\*Significant at 0.05 level

The results (table 4.24) of Bonferroni explained that significant mean difference was exists between the pairs of forward and mid field, mid field and fullback. Besides it was observed that hockey players pertaining to mid filed were found to be higher performance in neuroticism stability (17.02) have compared to forward and fullback of hockey players (12.96 and 12.74). Further when comparing the mean differences existing between the remaining pair of forward Vs fullback the mean difference exists was found as statistically not significant as far as the performance of neuroticism stability is concerned.

**Figure: 8 Bar diagram shows the mean values on neuroticism stability**



**Table 4.25 Descriptive statistics on Aggression**

| Variable   | Positions | Mean  | Standard Deviation |
|------------|-----------|-------|--------------------|
| Aggression | Forward   | 59.75 | 4.42               |
|            | Mid field | 57.30 | 3.77               |
|            | Fullback  | 59.26 | 4.27               |

Table 4.25 shows the descriptive measures on aggression of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 59.75, 4.42 (forward), 57.30, 3.77 (midfield) and 59.26, 4.27 (fullback).

**Table 4.26 Analysis of Variance on Aggression among the Forward, Mid-filed and Full back Hockey Players**

| Variable   | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|------------|---------------------|----------------|--------------------|-------------|---------|
| Aggression | Between Groups      | 150.08         | 2.00               | 75.04       | 4.34*   |
|            | Within Groups       | 2128.78        | 123.00             | 17.31       |         |
|            | Total               | 2278.86        | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.26 demonstrates that the obtained 'F' value was 4.34. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F' value (4.34) was found as higher than the table value (3.07), it was inferred that the mean difference among the forward, mid-filed and full back hockey players on aggression is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are given in the table 4.27 as follows.



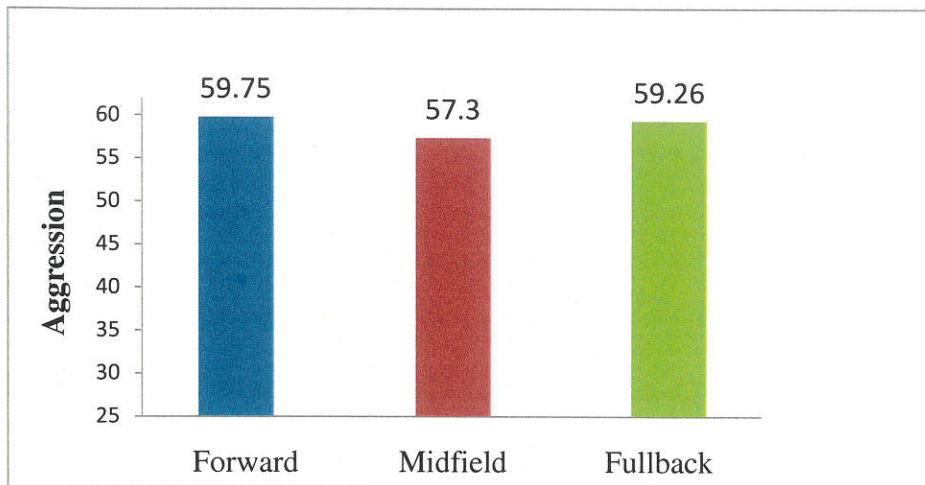
**Table 4.27 Bonferroni Post-hoc test on Aggression**

| <b>Forward</b> | <b>Mid field</b> | <b>Fullback</b> | <b>Mean Difference</b> | <b>Sig.</b> |
|----------------|------------------|-----------------|------------------------|-------------|
| 59.75          | 57.30            | ----            | 2.45                   | 0.02*       |
| 59.75          | ----             | 59.26           | 0.49                   | 1.00        |
| ----           | 57.30            | 59.26           | -1.96                  | 0.12        |

\*Significant at 0.05 level

The results (table 4.27) of Bonferroni explained that significant mean difference was exists between the pair of forward and midfield. Besides it was observed that hockey players pertaining to forward were found to be higher performance in aggression (59.75) have compared to midfield of hockey players (57.30). Further when comparing the mean differences existing between the remaining pairs of forward vs fullback and midfield vs fullback the mean difference exists was found as statistically not significant as far as the performance of aggression is concerned.

**Figure: 9 Bar diagram shows the mean values on aggression**



**Table 4.28 Descriptive statistics on cohesion**

| Variable | Positions | Mean   | Standard Deviation |
|----------|-----------|--------|--------------------|
| Cohesion | Forward   | 120.35 | 28.60              |
|          | Mid field | 106.68 | 3.20               |
|          | Fullback  | 89.17  | 2.57               |

Table 4.28 shows the descriptive measures on cohesion of hockey players pertain to varied positions namely forward, midfield and fullback is as follows. The mean and standard deviation are: 120.35, 28.60 (forward), 106.68, 3.20 (midfield) and 89.17, 2.57 (fullback).

**Table 4.29 Analysis of Variance on cohesion among the Forward, Mid-filed and Full back Hockey Players**

| Variable | Sources of variance | Sum of Squares | Degrees of Freedom | Mean Square | F-ratio |
|----------|---------------------|----------------|--------------------|-------------|---------|
| cohesion | Between Groups      | 19362.03       | 2.00               | 9681.01     | 30.43*  |
|          | Within Groups       | 39129.46       | 123.00             | 318.12      |         |
|          | Total               | 58491.50       | 125.00             |             |         |

\*Significant at 0.05 level. (2, 123) 3.07

Table 4.29 shows that the obtained 'F' value was 30.43. To be significant at 0.05 levels for degree of freedom 2 and 123, the required critical value was 3.07. Hence, observed 'F value (30.43) was found as higher than the table value (3.07), it was concluded that the mean difference among the forward, mid-filed and full back hockey players on cohesion is statistically significant. Following the results of significant mean difference among the varied positions of hockey players namely forward, midfield and full back, to find out the group which is this source for significant mean difference as post hoc test, Bonferroni test was applied. The results of this are provided in the table 4.30 as follows.

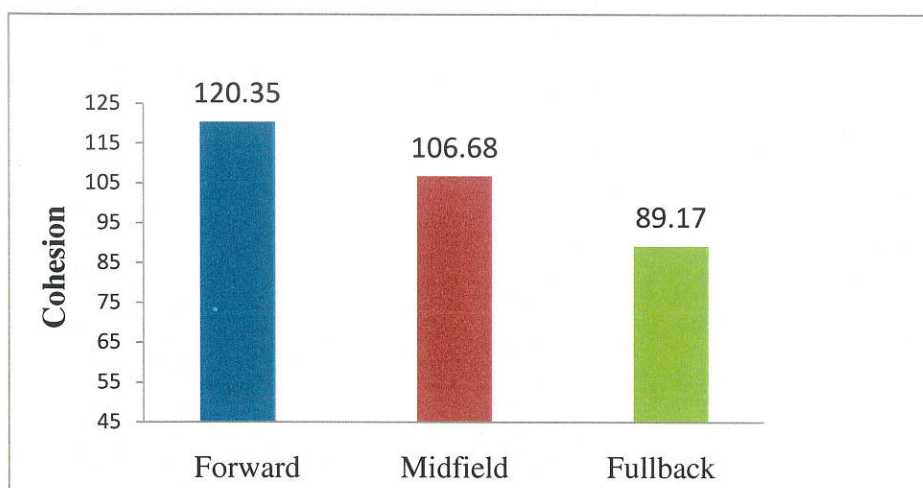
**Table 4.30 Bonferroni Post-hoc test on cohesion**

| Forward | Mid field | Fullback | Mean Difference | Sig.  |
|---------|-----------|----------|-----------------|-------|
| 120.35  | 106.68    | ----     | 13.67           | 0.01* |
| 120.35  | ----      | 89.17    | 31.17           | 0.00  |
| ----    | 106.68    | 89.17    | 17.50           | 0.00  |

\*Significant at 0.05 level

The results (table 4.30) of Bonferroni explained that significant mean difference was exists between the pairs of forward and mid field, forward and fullback and mid field and fullback. Besides it was observed that hockey players pertaining to forward were found to be higher performance in cohesion (120.35) have compared to midfield and fullback of hockey players (106.68 and 89.17). The mean difference exists was found as statistically significant as far as the performance of cohesion is concerned.

**Figure: 10 Bar diagram shows the mean values on cohesion**



### 4.3 DISCUSSION ON FINDINGS

From the results of the one way analysis of variance, it was observed that the mean difference exists among that positional play of forward, midfield and full back on selected psychosociological variables of focus,

self-confidence, competitive desire, resilience, general fear, competitive anxiety, extroversion introversion, neuroticism stability, aggression and cohesion is statistically significant. Thus the formulated hypothesis No.1 is accepted. Further to find out the source for such a significant mean differences among them, post- hoc test was applied. Results of post-hoc test explained that each positional play has significantly differed from one another on selected psychosociological aspects. Having the results of these, how each positional play is differed from others and having similarity on psychosocial variables are discussed in the following aspects using theoretical and empirical constructs.

Forward positional players were found as higher in competitive anxiety, aggression, resilience, general fear and cohesion as compared to the other positional play of mid-field and fullback. Besides, the state of forward positional players on extroversion-introversion, neuroticism stability, the derived results are explained them as in the state of introversion and neuroticism. In studying the nature of competitive anxiety, which is the cognitive element encompassing concern about the competition. The other is the somatic element covering the physical or physiological symptoms such as erratic heartbeat, difficulty in breathing, tensing of muscles, and queasiness (Marchant, Morris Anderson, 1998). As another significant variable that was higher for forward positional play is aggression. In sports, frustration often is a result of an unsuccessful event or outcome; therefore, the frustration-aggression hypothesis predicts that poor performance (i.e., the lack of success) precedes aggression. Widmeyer and Birch (1984) hypothesized that early in a hockey game, aggression might facilitate performance, whereas later in a game aggression might be a result of frustration.

During the game situation, the forward positional players play offensively and spend most of the game up-field towards the opposing team goal. According to the new set of field hockey rules and regulations,

there is no offside in this game and works and on advantage for the forward positional players as they can take a strategic position in the opponents 'D' area, waiting for the fellow players to create scoring opportunities. Generally, team prepared fielding three players in the attacking position, the right wing, left wing and center forward. A player playing in any of these positions needs to have a good co-ordination with the fellow players as well as mid fielders.

Following this, when analyze the players of forward positional play in relation to group environment and resilience, their major job could be a significant factor for their dominance on these aspects as compared to other forward positional players. Resiliency is the ability of an individual to achieve success in the midst of adversity and negative experiences (Milgram & Palti, 1993). During the game situation, the players of forward positional play may begin their task from setting the ball from their fellow players either from mid field or fullback or to score the goal using passing and receiving the ball from their own positional players. Such a task of forward positional play of hockey players, motivate them to equip themselves in acquiring the character of joint togetherness and with standing capacity and might have been the source to score higher significantly on cohesion and resilience as compared to other positional play.

Following the discussion of forward position play the discussion on psychosocial aspects of mid fielders are as follows. As far as midfielders positional play on psychosocial aspects are concerned, they are significantly differ and higher on extraversion-introversion, neuroticism-stability and self confidence as compared to other positional play of forward and fullback hockey players. Mid field positional players are apprehended by extraversion, stability and self confidence. Midfielders fielded the hockey players in the region of inner right, inner left and center half. These players required stamina for both physical and mental as they



have to assist in supplying the ball to forward positional players and receive from the fullback players. Thus, the hockey players in the midfield, possess the dual face during the game situation. Results on the present study also highly coincide with functional environments of midfielder as they found as higher on extraversion-introversion, neuroticism-stability and self-confidence. In nature, the extraverts are characterized as socially movable; abstract thinking, able to create pain. Besides extraversion character is very important for a smooth functioning of the social mechanism within a team since it is strongly linked to intra-team processes on contextual performance regarding the social and motivational context in which team operates (Borman & Motowol, 1993). Extraverts are talkative, outgoing. Enthusiastic, energetic, optimistic and assertive (Costs & Mccrane, 1992) and researchers expect these characteristics to result in a positive attitude toward team work (Barrow et.al, 1998).

Furthermore, extraversion (Mohammed & Angell, 2003) and their attitude should foster a climate in which team members feel free to express themselves. Extraverts may be expected like to work within a team merely for the possibility of social interaction. As far as neuroticism- stability of the midfielder is concerned, they have higher emotional stability. This can be described as self confidence and secure about chances and goals and decisions. Molleman et.al, (2004). Opined that emotional stability is expected to be positively related to team performance. Thus the functional environment of midfielders during the game situations and midfielders dominant on selected psychosocial characters of extraversion- introversion, neuroticism- stability and self-confidence are significantly having the functional association with another.

In analyzing the psychosocial aspects of fullback positional players, the results are favoured on the variables of focus and competitive desire where their score is significantly higher as compared to the players of forward and midfield. Focus on a character, it refers the ability to

concentrate on the performance of a task even in the face of distraction (Jones et.al, 2002). When a player is focused, he doesn't notice the other things going around him whether it may be positive or negative. An ability to block out distractions and remain, focused on relevant task information that has been associated with success in competition (Loehr, 1982). Having this character of focus, fullback players would be able to read and react to move quickly and understand the team concept. Moreover in nature, the fullback positional demands that must read the offensive obtains available to defect, and attempt to force the opponent to stop down; the speed of an attack, to provide to set up better coverage. These demands can be achieved by a fullback player only in presence of having high and focus on the game situation and teams of both his own and opponent.

Moreover, how the forward positional players are having significant responsibilities on winning the game and bringing the laurels to the team by scoring the goal, the fullback positional players are also having equal responsibilities in winning the game by their successful defending mechanism. Such an environment enhances their focus on finding the sources to win and rightly identified the needed stimuli. It develops the eager to know about their fellow players and opponents strength and weakens even before the matches commenced. In such a way, the fullback players might have higher in the psychosocial characters of competitive desire and focus.

#### **4.4. Results on Stepwise Discriminant Functional Analysis**

The main purpose of the present study is, predicting the group membership using the psychosociological variables namely focus, self confidence, competitive desire, resilience, general fear, competitive anxiety, extroversion introversion, neuroticism stability, aggression and cohesion. To achieve this, stepwise discriminant functional analysis was used. In discriminant functional analysis, initially examining the



differences if any between groups on each of the independent variables would help to processing for further analysis. In such a way the derived results on group statistics provides rough idea about the status of variables that may be important by inspecting group means and standard deviations of independent variables pertain to three groups of forward, mid field and fullback hockey players are presented in Table - 4.31.

**Table – 4.31 Group Statistics**

| S.No | Variables                    | Groups            |                 |                 |
|------|------------------------------|-------------------|-----------------|-----------------|
|      |                              | Forward           | Mid-field       | Full back       |
|      |                              | Mean<br>± S. D    | Mean<br>± S. D  | Mean<br>± S. D  |
| 1    | Focus                        | 14.35<br>± 2.21   | 13.45<br>±2.05  | 14.68<br>±2.12  |
| 2    | Self-confidence              | 12.58<br>± 1.921  | 14.27<br>±5.11  | 12.44<br>±1.94  |
| 3    | Competitive desire           | 12.33<br>± 1.86   | 11.11<br>±1.40  | 13.77<br>±2.06  |
| 4    | Resilience                   | 16.48<br>± 1.50   | 15.20<br>±2.79  | 15.29<br>±1.78  |
| 5    | General fear                 | 57.60<br>± 10.99  | 53.02<br>±11.49 | 50.62<br>±8.62  |
| 6    | Competitive anxiety          | 20.92<br>± 1.92   | 17.09<br>±2.57  | 19.70<br>±2.55  |
| 7    | Extroversion<br>introversion | 11.85<br>± 1.68   | 15.38<br>±3.19  | 13.71<br>±2.51  |
| 8    | Neuroticism<br>stability     | 12.96<br>± 2.26   | 17.02<br>±2.77  | 12.73<br>±2.93  |
| 9    | Aggression                   | 59.75<br>± 4.42   | 57.29<br>±3.77  | 59.26<br>±4.267 |
| 10   | Cohesion                     | 120.35<br>± 28.61 | 106.68<br>±3.20 | 89.17<br>±2.57  |

In stepwise discriminant analysis, at each step one of the independent variables was selected as discriminating variables based on the criteria of significant highest wilks lambda value. Having this, the following was observed that as primary variables that there were responsible for the separation of the three groups of hockey players are: competitive desire, competitive anxiety, extroversion – introversion, neuroticism – stability and cohesion. It was displayed with its wilks lambda value in the Table – 4.32.

**Table – 4.32 Variables in the Analysis**

| <b>Step</b>                  | <b>Tolerance</b> | <b>F- to Remove</b> | <b>Wilks' Lambda</b> |
|------------------------------|------------------|---------------------|----------------------|
| Neuroticism<br>stability     | .916             | 10.920              | .341                 |
| Cohesion                     | .948             | 16.699              | .369                 |
| Extroversion<br>introversion | .933             | 7.115               | .322                 |
| Competitive<br>desire        | .908             | 6.862               | .321                 |
| Competitive<br>anxiety       | .876             | 6.324               | .319                 |

**Table – 4.33 Eigen Values**

| <b>Function</b> | <b>Eigen value</b> | <b>% of Variance</b> | <b>Cumulative %</b> | <b>Canonical Correlation</b> |
|-----------------|--------------------|----------------------|---------------------|------------------------------|
| 1               | 1.102              | 62.8                 | 62.8                | .724                         |
| 2               | 0.652              | 37.2                 | 100.0               | .628                         |

Table - 4.33 provides information on each of the discriminant functions produced. The maximum number of groups minus 1 in the present study the numbers of groups used are three namely forward, mid field and fullback. Thus two functions are displayed. Since the dependent, positional play has three groups, the eigen value (1,102) for function 1 explain 62.8% of variance and the function 2 explain 37.2% of variance. These eigen values or related to canonical correlation (0.72, Function 1, 0.62 Function -2) and describe how much discriminating ability a function process the magnitude of eigen values or indicative of the fictional discriminating abilities.

**Table – 4.34 Standardized Canonical Discriminant Function Co-efficient**

| Variables                    | Function |         |
|------------------------------|----------|---------|
|                              | 1        | 2       |
| Competitive desire           | - 0.154  | - 0.507 |
| Competitive anxiety          | - 0.441  | 0.138   |
| Extroversion<br>introversion | 0.434    | - 0.199 |
| Neuroticism<br>stability     | 0.550    | 0.163   |
| Cohesion                     | - 0.078  | 0.760   |

The standardized canonical discriminant coefficient explains the five variables namely, competitive desire, competitive anxiety, extroversion introversion, neuroticism stability and cohesion, how these variables combine, to make a new one that maximally separates the hockey players based on the psychosocial functions. Function - 1 could be labeled as competition pressure since it is defined by the high positive loadings of extroversion introversion (0.43) and neuroticism stability (0.55) and negatively loaded of competitive anxiety (-0.44). Likewise, the function - 2 could be (- 0.44) labeled as intrinsic pressure since it is defined by positive loading of cohesion (0.76) and negatively loaded competition desire (-0.50).

**Table – 4.35 Function at Group Centroid**

| <b>Group</b>     | <b>Function</b> |          |
|------------------|-----------------|----------|
|                  | <b>1</b>        | <b>2</b> |
| <b>Forward</b>   | - 0.958         | 0.701    |
| <b>Mid field</b> | 1.388           | 0.214    |
| <b>Full back</b> | - 0.444         | - 1.267  |

Table -4.35 shows the group centroid on the two new canonical variables formed by applying the discriminant function weights. Forward position of field hockey players has a mean of – 0.958, midfield position of field hockey players has a mean of 1.388 and full back position of field hockey players has a mean of -0.444. Thus new cases would be classified into groups whose centroid their own vector scores.

**Table – 4.36 Classification Function Coefficients**

| S.No | Variables                 | Groups   |           |           |
|------|---------------------------|----------|-----------|-----------|
|      |                           | Forward  | Mid field | Full back |
| 1    | Competitive desire        | 4.498    | 4.433     | 5.015     |
| 2    | Competitive anxiety       | 4.071    | 3.599     | 3.858     |
| 3    | Extroversion introversion | 3.198    | 3.640     | 3.442     |
| 4    | Neuroticism stability     | 2.969    | 3.429     | 2.954     |
| 5    | Cohesion                  | 0.401    | 0.370     | 0.315     |
|      | Constant                  | -133.606 | -133.378  | -130.280  |

Table – 4.36 explained the classification results for varied positions of hockey players based on the discriminant variables of psychosocial aspects. Based on the discriminant function scores obtained for varied positions of hockey players namely forward, midfielder and full back the equation has been formulated positional wise as follows.

**Psychosociological (Forward)**

$$= 4.498 \text{ (Competitive desire)} + 4.071 \text{ (Competitive anxiety)} + 3.198 \text{ (Extroversion- introversion)} + 2.969 \text{ (Neuroticism stability)} + 0.401 \text{ (Cohesion)} + (-133.606) \text{ (Constant)}$$

**Psychosociological (Midfield)**

$$= 4.433 \text{ (Competitive desire)} + 3.640 \text{ (Extroversion- introversion)} + 3.599 \text{ (Competitive anxiety)} + 3.429 \text{ (Neuroticism stability)} + 0.370 \text{ (Cohesion)} + (-133.378) \text{ (Constant)}$$

**Psychosociological (Fullback)**

$$= 5.015 \text{ (Competitive desire)} + 3.858 \text{ (Competitive desire)} + 3.442 \text{ (Extroversion introversion)} + 2.954 \text{ (Neuroticism stability)} + 0.315 \text{ (Cohesion)} + (-130.280) \text{ (Constant)}$$

**Table – 4.37 Classification Results**

| Group          |           | Predicted Group Membership |           |          | Total |
|----------------|-----------|----------------------------|-----------|----------|-------|
|                |           | Forward                    | Mid field | Fullback |       |
| Original Count | Forward   | 41                         | 5         | 2        | 48    |
|                | Mid field | 4                          | 37        | 3        | 44    |
|                | Fullback  | 4                          | 2         | 28       | 34    |
| %              | Forward   | 85.4                       | 10.4      | 4.2      | 100.0 |
|                | Mid field | 9.1                        | 84.1      | 6.8      | 100.0 |
|                | Fullback  | 11.8                       | 5.9       | 82.4     | 100.0 |

Table 4.37 illustrates the classification results as follows; based on the derived five discriminator variables, the validity of the players position was tested as follows.

#### **Classification Results Pertaining to Forward Position**

In analyzing the classification results pertaining to forward position of hockey players (N=48), the quality of studying the results as follows. The derived results indicates that 85.4 percent for forward position of hockey players have the required quality of fitting into this category, 10.4 percent of players are have the quality of fitting into midfield position of hockey and the remaining 4.2 percent of hockey players are having the quality of fitting into full back category.



### **Classification Results Pertaining to Mid Field Position**

In analyzing the classification results pertaining to mid field position of hockey players (N= 44), the quality of studying the results as follows: The derived results indicates that 9.1 percent for forward position of hockey players have the required quality of fitting into this category, 84.1 percent of players are having the quality of fitting into midfield position of hockey and the remaining 6.8 percent of hockey players possess the quality of fitting into full back category.

### **Classification Results Pertaining to Fullback Position**

In analyzing the classification results pertain to fullback position of hockey players (N=34), the quality of studying the results as follows. The derived results indicates that 11.8 percent for forward position of hockey players have the required quality of fitting into this category, 5.9 percent of players do have the quality of fitting into midfield position of hockey and the remaining 82.4 percent of hockey players are having the quality of fitting into full back category. Based on the results of predicting the group membership the hypothesis formulated No.2 is accepted.

## **4.5 DISCUSSION ON RESULTS OF CLASSIFICATION**

The primary purpose of the present study is how far the psychosociological variables of focus, self-confidence, competitive desire, resilience, general fear, competitive anxiety, extroversion introversion, neuroticism stability, aggression and cohesion used in the study significantly discriminating the positional play of hockey players such as forward, midfield and fullback. For this, the data collected from hockey players who were the participants of inter-collegiate tournaments was treated with stepwise discriminant functional analysis. The results of stepwise discriminant analysis extracted the variables namely competition desire, competitive anxiety, extraversion-introversion, neuroticism-

stability and cohesion as the effective discriminators based on its Wilks' lambda value. The remaining variables of general fear, focus, self-confidence, resilience and aggression not accounted in this analysis though these are also having close association with the game of hockey. Thus the results derived from step-wise discriminant functional analysis are discussed below.

As far as the nature of the game of hockey is concerned, extracted factors as the most significant discriminators in predicting the group membership of varied positional play from psychosociological aspects can be considered as the valuable determinants. Hockey is a game of team sport. The players of this game can be grouped as forward, mid field and fullback based on their positional play. When studying the nature of these positional play forward positional players are more prone to competitive stress, mental imbalance, agitation of mind, anxiety, aggression, resilience as compared to others positional play.

In considering the state of midfielders, their nature of job is to function as a bridge between the forward positional players and fullback positional players. In the present study midfield players were identified as extravert and more emotionally stable. This extraversion-introversion, neuroticism-stability is loaded as significant discriminator which significantly rationalize the nature of the midfielders. Apart from this, the other discriminators of competitive anxiety, competitive desire and cohesion in the present study, competition anxiety and cohesion were also found to be the required character for forward positional players. As the present study is confirming the influence of competitive anxiety as one of the in predicting the structure of players Terry and Youngs (1996) who has also identified the competitive anxiety as a significant predictor in classifying the Field hockey players. In his study the results of discriminant function analysis showed that 74 participants (57.81%) could be correctly classified as selected or non selected players on the basis of

pre-performance mood scores. This figure rose to 83 participants (64.84%) when scores on the anxiety subscales were also included in the discriminant function analysis. Anxiety scores alone discriminated 71 participants (55.47%). These results concur with earlier proposals of Terry that psychological state measures decline in predictive effectiveness in long duration, open skill team sports.

Besides, the remaining discriminant of competitive desire is found as component under lie the fullback positional players. The classification results of the present study are substantiated by the classification results made form the study of Kirkcaldy (1982). In his study administered the Eysenck personality questionnaire to athletes. By comparing team and individual athletes using uni-variate and multiple discrimination function analysis method, no significant differences were found to exist among the personality dimensions. However, when team sports were considered separately and by categorizing athletes into one of the three classes (offensive, center and defensive players), it was found that males in attacking positions were substantially higher in "Psychoticism (tough minded, dominant, aggressive) and extroversion" compared to mid-field players. The forward, offensive players were less easily differentiated from defensive players, the later group exhibiting a more "emotionally stable" pattern than the offensive athletes. In females the trend was somewhat reversed, that is attacking players were less extroverted and neurotic than players from other positions.