CHAPTER – IV

RESULTS AND DISCUSSIONS

4.1 OVERVIEW

This chapter deals with the analysis of data collected from the samples under study. The purpose of this study was to construct norms for engineering college men hockey players. To achieve the purpose of the study, one thousand two hundred and forty men hockey players were selected from engineering colleges in Tamil Nadu state at random and their age ranged from 18 to 25 years. The skill test were constructed for the following hockey skills namely, Dribble Flick, Drag and Flick, Dribble and Drag Flick, Drag and Push, Dribble Drag and Push, Drag and Scoop, Dribble and Drag Scoop and Angle Shooting. The data obtained from all the variables were first subjected to descriptive analysis in order to have an idea about the characteristics of all the selected variables. Secondly, percentiles and 6 sigma scale was used to construct norms for the eight variables. The level of significance was set at 0.05 level, which was considered appropriate, as the research procedure adopted in this study did not involve highly sophisticated equipment's, demanding the application of more stringent levels of significance.

4.2 DEVELOPMENT OF NORMS

A test that has accompanying norms is definitely prepared to the one that does not. These provide information to the subjects and the

teachers that may be useful to them to interpret the subject's scores in relation to the scores made by other individuals in the same population. Norms are usually based on age, grade, height, weight or various combinations of these (Johnson and Nelson, 1982). A norm is a scale that permits conversion from a raw score to a score capable of comparisons and interpretations. It is obvious that if a test is accompanied by norms, its usefulness is enhanced. Its characteristics of average and range are known. The test accompanied by norms has several advantages over tests without norms. Norms enable one to interpret player's scores in relation to a large group in the same population. Their use enables a comparison of performance of a player with other players, and gives uniform meaning to the comparison of a player's score on one test with his score on another. In addition, norms provide a reliable and useful basis for interpretation and evaluation of test results.

Percentile norms have been developed for several popular tests in Physical Education. It is impossible to know how well one has done on a test unless his score is shown in relation to others taking or having taken the same test. Norms using percentiles are widely applicable, appropriate for many situations, and easy to interpret by players as well the coaches and trainers. A percentile score norm indicates a player's relative position in a group and informs the player of the percentage of players who score below his score. It is a common procedure that establishing the norms of a test is possible only if the related data are

representing a mostly normal probability curve. Therefore, the normality of distribution of scores as obtained from each item of the skill test was statistically tested separately. After finding out the nature of distribution and on the basis of the characteristics of probability curve, the percentile norms each test item were determined and for this, the scores in each item were grouped together and divided into logical step-intervals for frequency distribution.

All the individual performance of the variable was converted as composite score. A 6-sigma scale, i.e. 3 standard deviations above the mean and 3 standard deviations below the mean was developed to construct the norms.

4.3 STATISTICAL ANALYSIS

The construction of a norm for Hockey Skill was based on the administration followed by statistical analysis of 8 skill test items to a sample of 1240 men Hockey players studying in the engineering colleges in Tamil Nadu in the age group of 18-25 years.

4.3.1 RESULT ON THE NORMS OF DRIBBLE FLICK

The below table – VI shows the descriptive analysis of the Dribble Flick for the variable, the mean score was 6.1 and Standard Deviation was 1.77, Std. Error of mean was 0.05, Skewness 0.312, std. Error of Skewness .069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -0.779, which is leptokurtic in nature. Moreover, the standard error of

Kurtosis (σku = 0.139) is minimum and by the subjects is Not significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is normal.

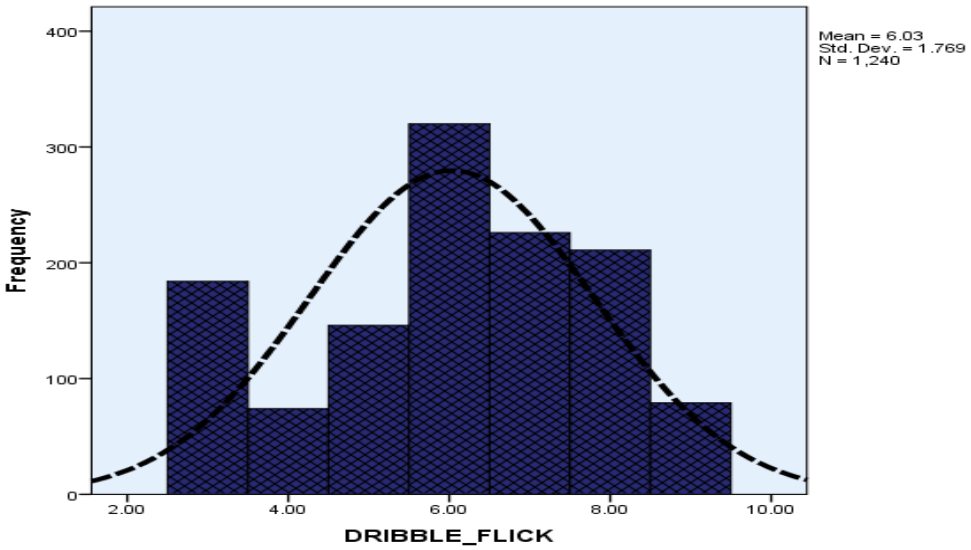
TABLE - VI

Descriptive Analysis of Dribble Flick

Statistical Measures	Distribution Characteristics of Scores in Test-Item Dribble Flick
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.1
Std. Error of Mean	.05
Std. Deviation	1.766
Variance	3.118
Skewness	-.312
Std. Error of Skewness	.069
Kurtosis	-0.776
Std. Error of Kurtosis	.139

FIGURE 1a

Histograms with Normal Curve of Dribble Flick



The Dribble Flick test was administered with statistical doctrine for skewness (Sk = 0.312) and Kurtosis (Ku = 0.776) signify that the distribution is intently normal but it is positively skewed.

TABLE - VII

The Percentile Scale Norms of Dribble Flick

Norms for test items		
Mean		6.10
Median		6.00
Std. Deviation		1.77
Percentiles	10	3.00
	20	5.00
	30	5.00
	40	6.00
	50	6.00
	60	7.00
	70	7.00
	80	8.00
	90	8.00
	100	9.00

The above table shows the Percentile Scale for Dribble flick for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - VIII

6 - Sigma Scale for Dribble Flick

Six Sigma Scale	Dribble Flick
-3σ	0.8
-2σ	2.5
-1σ	4.3
σ	6.10
1σ	7.9
2σ	9.6
3σ	11.4

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – IX.

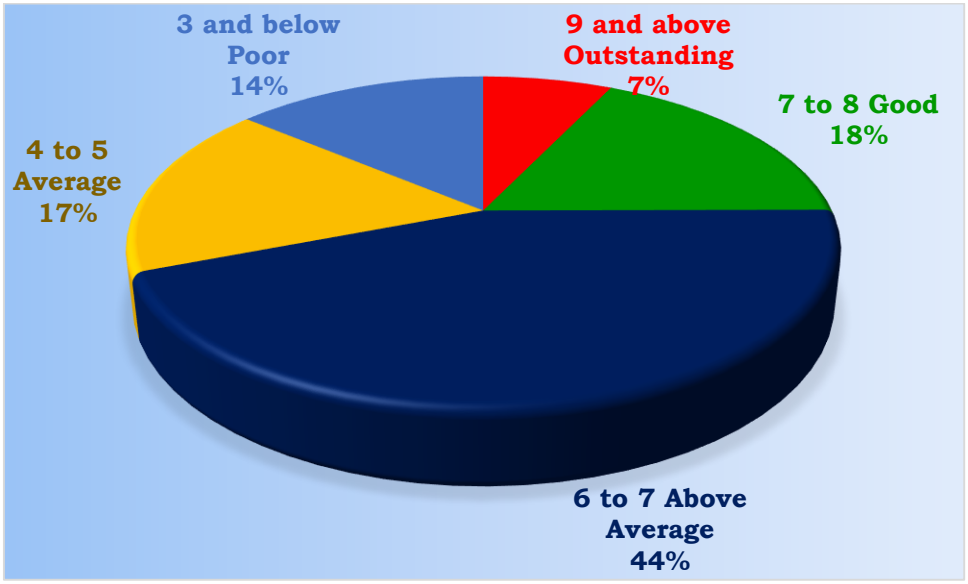
TABLE - IX

The Qualitative Grading for the Constructed Norms of Dribble Flick

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**88**
7 to 8	**Good**	**221**
6 to 7	**Above Average**	**548**
4 to 5	**Average**	**211**
3 and below	**Poor**	**172**

FIGURE 1b

The Pie Graph of Qualitative Grading of Dribble Flick



As per the qualitative grading it was found that out of 1240 subjects in Dribble Flick skill test 172 subjects (14%) were poor, 211 subjects (17%) were in average, 548 subjects (44%) were above average, 221subjects (18%) were in the good category and the remaining 88 subjects (7%) were in the outstanding category.

4.3.2 RESULT ON THE NORMS OF DRAG AND FLICK

The below table – X shows the descriptive analysis of the drag and flick for the variable, the mean score was 6.12 and Standard Deviation was 1.77, Std. Error of mean was 0.050, Skewness 0.340, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -0.779, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the subjects is Not

significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is also normal.

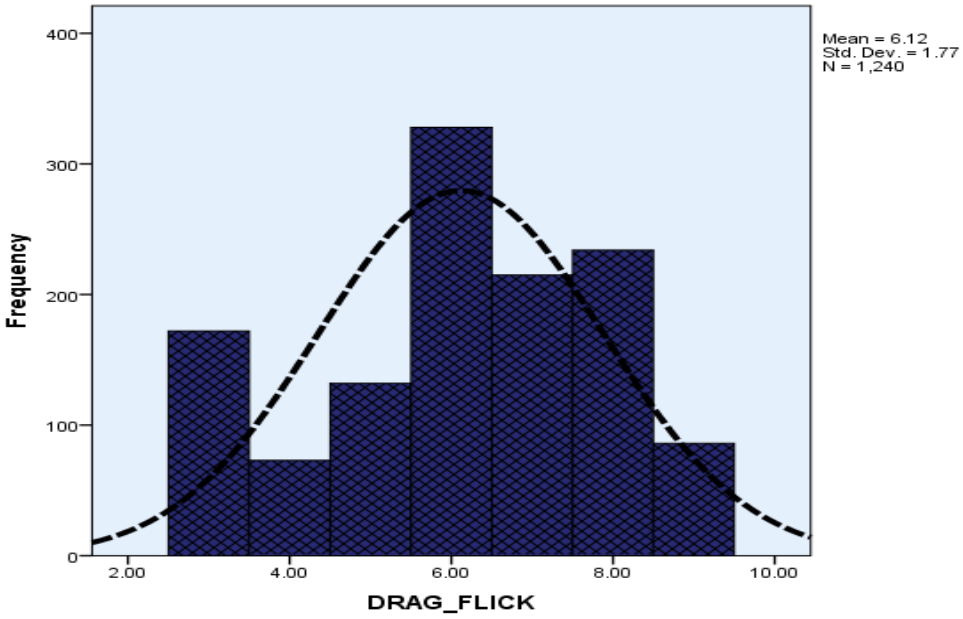
TABLE - X

Descriptive Analysis of Drag and Flick

Statistical Measures	Distribution Characteristics of Scores in Test-Item Drag and Flick
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.12
Std. Error of Mean	.050
Std. Deviation	1.77
Variance	3.13
Skewness	-.340
Std. Error of Skewness	.069
Kurtosis	-.779
Std. Error of Kurtosis	.139

FIGURE - 2A

Histograms with Normal Curve of Drag and Flick



To find Drag and Flick test was administered statistical doctrine for Skewness (Sk = 0.340) and Kurtosis (Ku = 0.779) signify that the distribution is intently normal but it is positively skewed.

TABLE - XI

The Percentile Scale Norms of Drag and Flick

Norms for test items		
Mean		6.12
Median		6.00
Std. Deviation		1.76
Percentiles	10	3.00
	20	5.00
	30	5.00
	40	6.00
	50	6.00
	60	7.00
	70	7.00
	80	8.00
	90	8.00
	100	9.00

The above table shows the Percentile Scale for dribble flick for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XII

6 - Sigma Scale for Drag and Flick

Six Sigma Scale	Drag and Flick
-3σ	0.8
-2σ	2.5
-1σ	4.3
σ	6.10
1σ	7.9
2σ	9.6
3σ	11.4

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XIII.

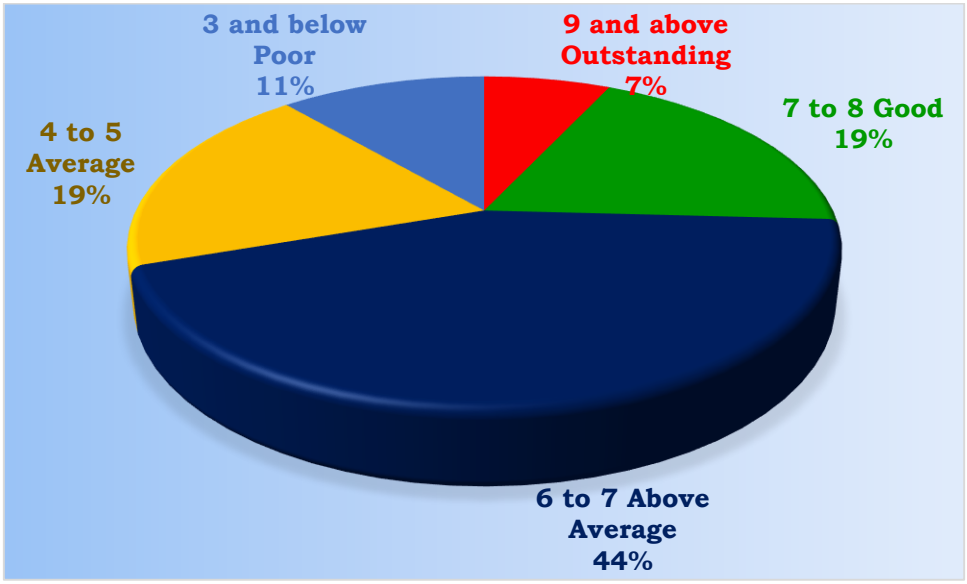
TABLE - XIII

The Qualitative Grading for the Constructed Norms of Drag and Flick

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**86**
7 to 8	**Good**	**234**
6 to 7	**Above Average**	**543**
4 to 5	**Average**	**235**
3 and below	**Poor**	**140**

Figure – 2B

The Pie Graph of Qualitative Grading for Drag and Flick



As per the qualitative grading it was found that out of 1240 subjects in Drag Flick skill test 140 subjects (11%) were poor, 235 subjects (19%) were in average, 543 subjects (44%) were above average, 234 subjects (19%) were in the good category and the remaining 86 subjects (7%) were in the outstanding category.

4.3.3 RESULT ON THE NORMS OF DRIBBLE AND DRAG FLICK

The below table – XIV shows the descriptive analysis of the Dribble and Drag Flick for the variable, the mean score was 6.03 and Standard Deviation was 1.77, Std. Error of mean was 0.050, Skewness 0.296, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -0.816, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the

subjects is Not significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is also normal.

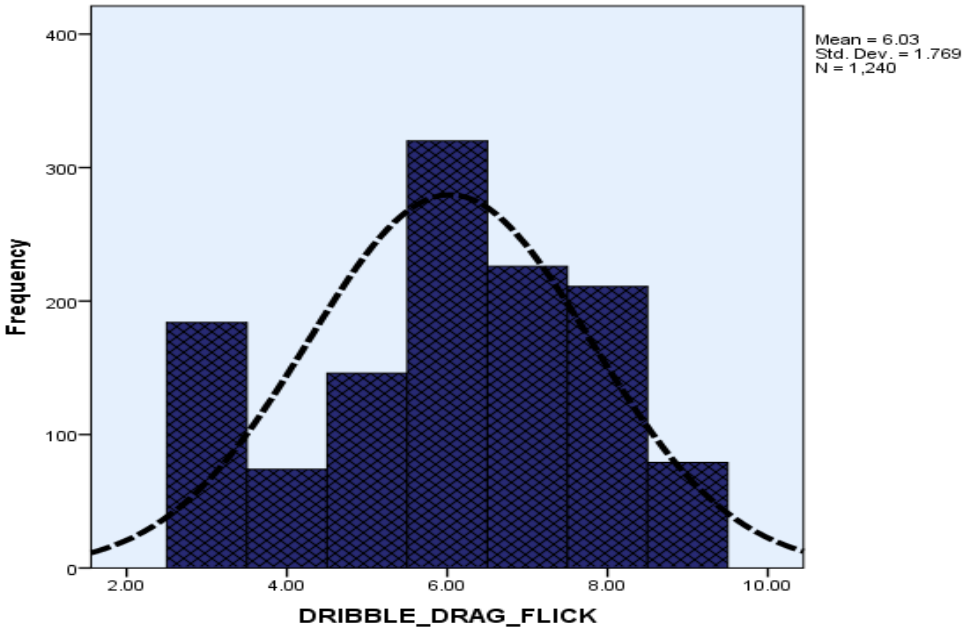
TABLE - XIV

Descriptive Analysis of Dribble and Drag Flick

Statistical Measures	Distribution Characteristics of Scores in Test-Item Dribble and Drag Flick
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.1
Std. Error of Mean	.050
Std. Deviation	1.77
Variance	3.130
Skewness	-.296
Std. Error of Skewness	.069
Kurtosis	-.816
Std. Error of Kurtosis	.139

FIGURE – 3a

Histograms with Normal Curve of Dribble and Drag Flick



To find Dribble and Drag Flick test was administered statistical doctrine for skewness (Sk = 0.296) and Kurtosis (Ku = 0.816) signify that the distribution is intently normal but it is positively skewed.

TABLE - XV

The Percentile Scale Norms of Dribble and Drag Flick

Norms for test items		
Mean		6.03
Median		6.00
Std. Deviation		1.77
Percentiles	10	3.00
	20	4.00
	30	5.00
	40	6.00
	50	6.00
	60	7.00
	70	7.00
	80	8.00
	90	8.00
	100	9.00

The above table shows the Percentile Scale for Dribble and Drag flick for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XVI

6 - Sigma Scale of Dribble and Drag Flick

Six Sigma Scale	Dribble and Drag Flick
-3σ	0.72
-2σ	2.5
-1σ	4.3
σ	6.03
1σ	7.8
2σ	9.6
3σ	11.3

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XVII.

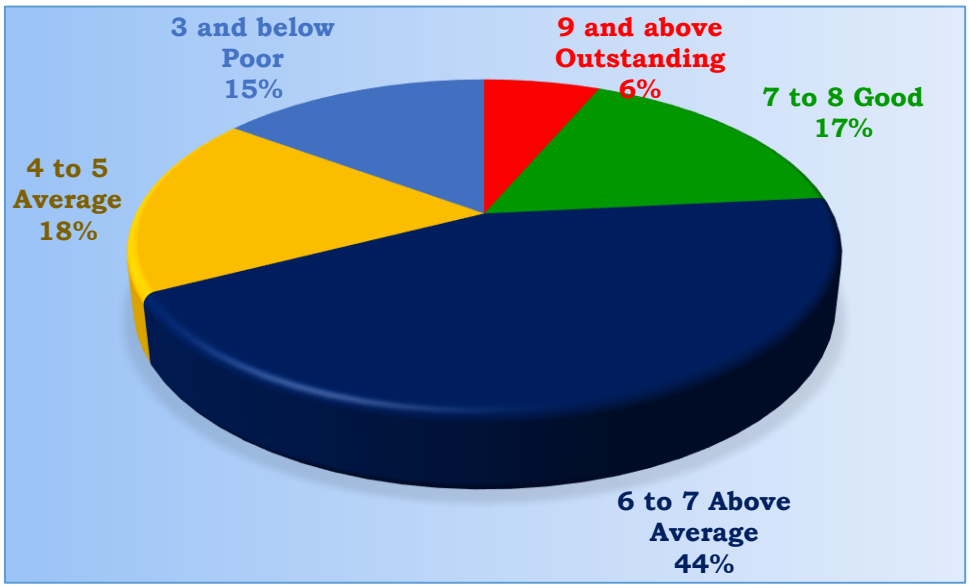
TABLE - XVII

The Qualitative Grading for the Constructed Norms of Dribble and Drag Flick

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	79
7 to 8	**Good**	211
6 to 7	**Above Average**	546
4 to 5	**Average**	220
3 and below	**Poor**	184

FIGURE – 3b

The Pie Graph of Qualitative Grading of Dribble and Drag Flick



As per the qualitative grading it was found that out of 1240 subjects in Dribble and Drag Flick skill test 184 subjects (15%) were poor, 211 subjects (18%) were in average, 546 subjects (44%) were above average, 211 subjects (17%) were in the good category and the remaining 79 subjects (6%) were in the outstanding category.

4.3.4 RESULT ON THE NORMS OF DRAG AND PUSH

The below table – XVIII shows the descriptive analysis of the Drag and Push for the variable, the mean score was 6.30 and Standard Deviation was 2.176, Std. Error of mean was 0.050, Skewness 0.186, std. Error of Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -1.260, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the

subjects is Not significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is also normal.

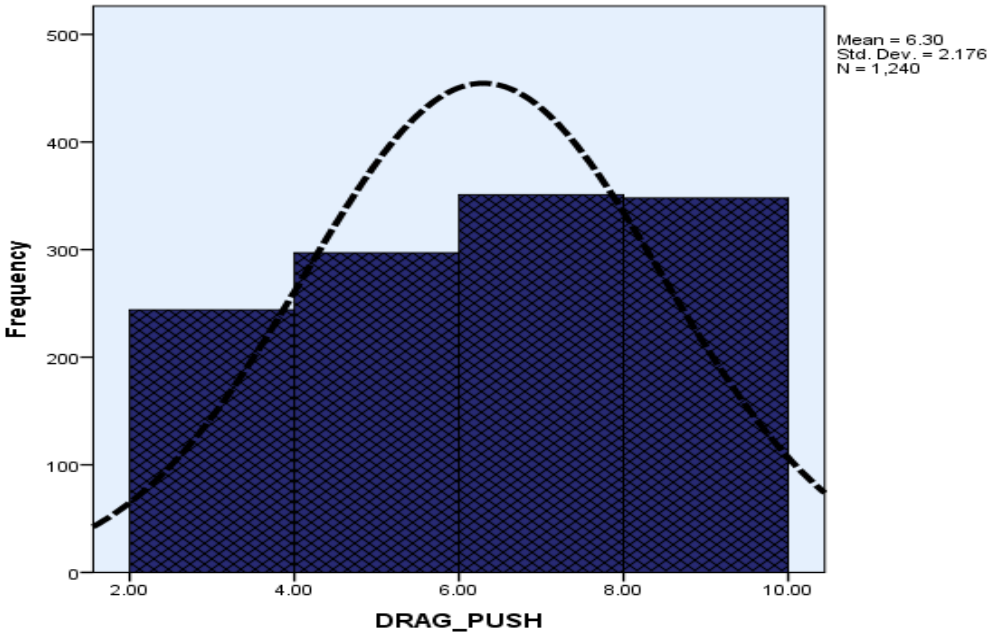
TABLE - XVIII

Descriptive Analysis of Drag and Push

Statistical Measures	Distribution Characteristics of Scores in Test-Item Dribble Drag and Push
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.3
Std. Error of Mean	.062
Std. Deviation	2.18
Variance	4.74
Skewness	-.186
Std. Error of Skewness	.069
Kurtosis	-.1260
Std. Error of Kurtosis	.139

FIGURE – 4a

Histograms with Normal Curve of Drag and Push



To find Drag and Push test was administered statistical doctrine for skewness (Sk = 0.186) and Kurtosis (Ku = 1.260) signify that the distribution is intently normal but it is positively skewed.

TABLE - XIX

The Percentile Scale Norms of Drag and Push

Norms for test items		
Mean		6.30
Median		7.00
Std. Deviation		2.18
Percentiles	10	3.00
	20	5.00
	30	5.00
	40	5.00
	50	7.00
	60	7.00
	70	7.00
	80	9.00
	90	9.00
	100	9.00

The above table shows the Percentile Scale for Drag and Push for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XX

6 - Sigma Scale for of Drag and Push

Six Sigma Scale	Dribble Drag and Push
-3σ	0.23
-2σ	1.95
-1σ	4.12
σ	6.30
1σ	8.48
2σ	10.65
3σ	12.8

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XIX.

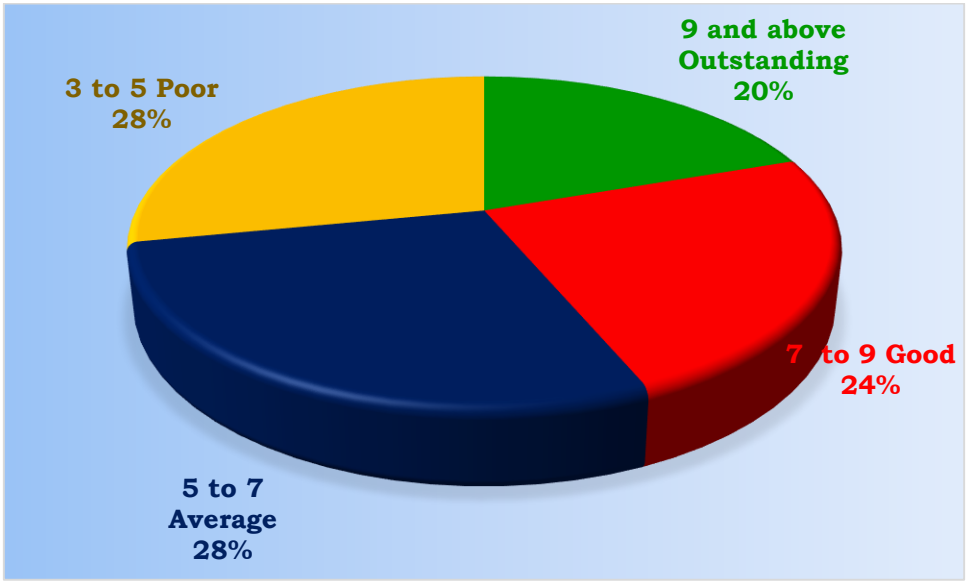
TABLE - XIX

The Qualitative Grading for the Constructed Norms of Drag and Push

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**244**
7 to 9	**Good**	**297**
5 to 7	**Average**	**351**
3 to 5	**Poor**	**348**

FIGURE – 4b

The Pie Graph of Qualitative Grading for Drag and Push



As per the qualitative grading it was found that out of 1240 subjects in Drag and Push skill test 348 subjects (14%) were poor, 351 subjects (17%) were in average, 297 (18%) were in the good category and the remaining 244 subjects (7%) were in the outstanding category.

4.3.5 RESULT ON THE NORMS OF DRIBBLE DRAG AND PUSH

The below table – XX shows the descriptive analysis of the Dribble Drag and Push for the variable, the mean score was 6.21 and Standard Deviation was 2.152, Std. Error of mean was 0.061, Skewness 0.132, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -1.24, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the subjects is Not significant statistically even at the 0.05 level (p>0.05). These

percentages of distribution showed that the curve representing the scores on this test items is also normal.

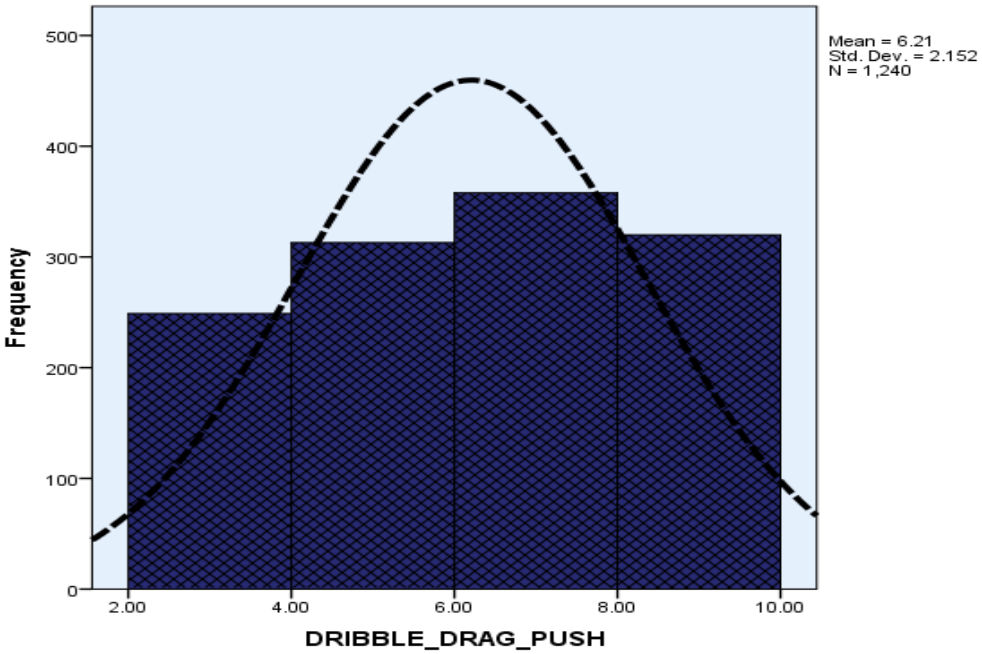
TABLE - XX

Descriptive Analysis of Dribble Drag and Push

Statistical Measures	Distribution Characteristics of Scores in Test-Item Dribble Drag and Push
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.21
Std. Error of Mean	.061
Std. Deviation	2.152
Variance	4.63
Skewness	-.132
Std. Error of Skewness	.069
Kurtosis	-.1.24
Std. Error of Kurtosis	.139

FIGURE – 5A

Histograms with Normal Curve of Dribble Drag and Push



To find Dribble Drag and Push test was administered statistical doctrine for skewness (Sk = 0.312) and Kurtosis (Ku = 0.776) signify that the distribution is intently normal but it is positively skewed.

TABLE - XXI
The Percentile Scale Norms of Dribble Drag and Push

Norms for test items		
Mean		6.21
Median		7.00
Std. Deviation		2.15
Percentiles	10	3.00
	20	3.00
	30	5.00
	40	5.00
	50	7.00
	60	7.00
	70	7.00
	80	9.00
	90	9.00
	100	9.00

The above table shows the Percentile Scale for Dribble Drag and Push for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE – XXII
6 - Sigma Scale for of Dribble Drag and Push

Six Sigma Scale	Dribble Drag and Push
-3σ	0.25
-2σ	1.90
-1σ	4.06
σ	6.21
1σ	8.36
2σ	10.51
3σ	12.7

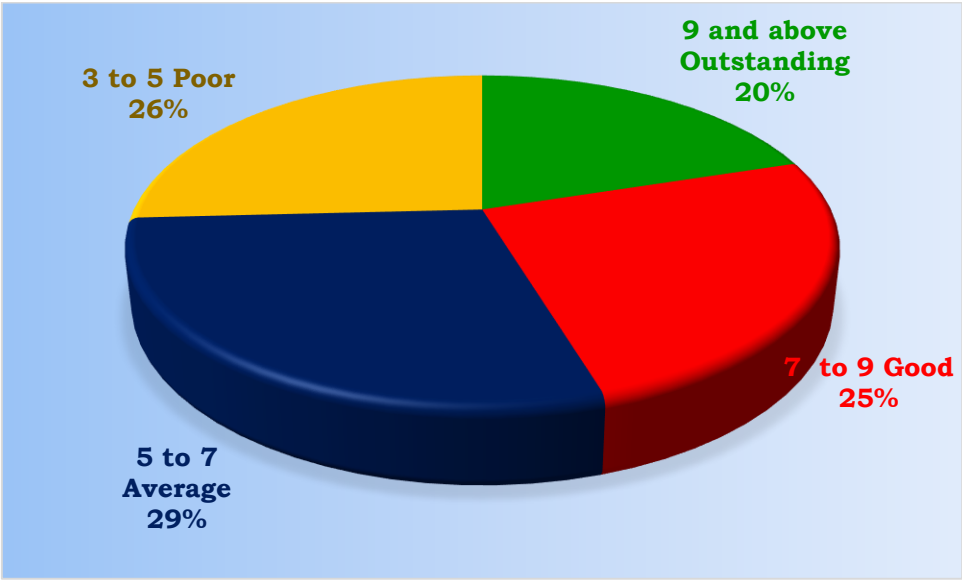
On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XXIII.

TABLE - XXIII
The Qualitative Grading for the Constructed Norms of Dribble Drag and Push

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**249**
7 to 9	**Good**	**313**
5 to 7	**Average**	**358**
3 to 5	**Poor**	**320**

Figure – 5b

The Pie Graph of Qualitative Grading of Dribble Drag and Push



As per the qualitative grading it was found that out of 1240 subjects in Dribble Drag and Push skill test 320 subjects (26%) were poor, 358 subjects (29%) were in average, 313 (25%) were in the good category and the remaining 249 subjects (20%) were in the outstanding category.

4.3.6 RESULT ON THE NORMS OF DRAG AND SCOOP

The below table – XXIV shows the descriptive analysis of the Drag and Scoop for the variable, the mean score was 6.25 and Standard Deviation was 2.18, Std. Error of mean was 0.062, Skewness 0.157, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was 1.275, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the subjects is Not significant statistically even at the 0.05 level ($p>0.05$). These

percentages of distribution showed that the curve representing the scores on this test items is also normal.

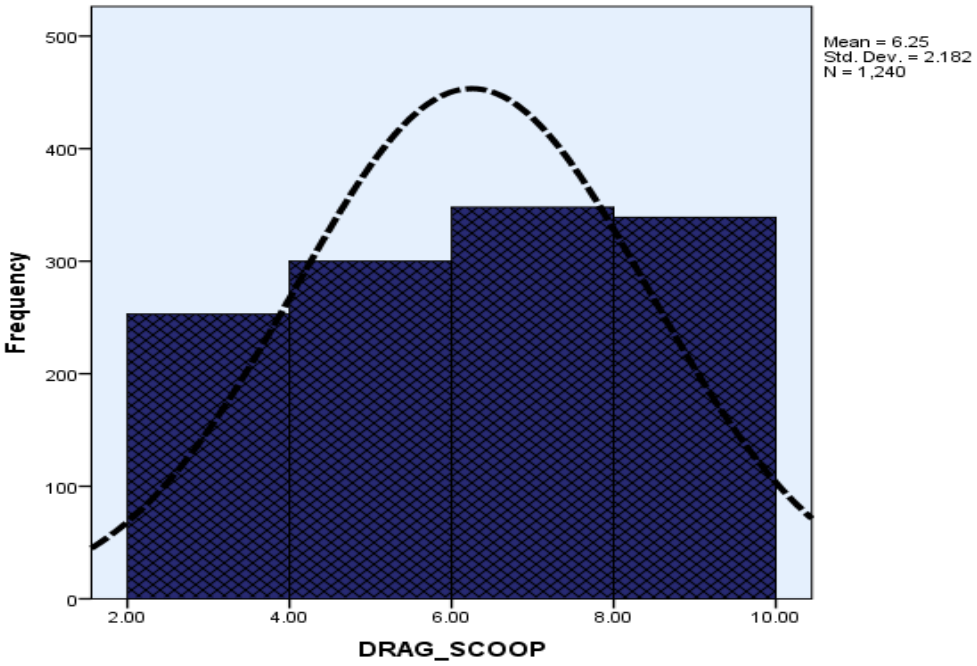
TABLE - XXIV

Descriptive Analysis of Drag and Scoop

Statistical Measures	Distribution Characteristics of Scoresin Test-Item Drag and Scoop
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.25
Std. Error of Mean	.062
Std. Deviation	2.182
Variance	4.75
Skewness	.157
Std. Error of Skewness	.069
Kurtosis	1.275
Std. Error of Kurtosis	.139

Figure – 6a

Histograms with Normal Curve of Drag and Scoop



To find Drag and Scoop test was administered statistical doctrine for skewness (Sk = 0.157) and Kurtosis (Ku = 1.275) signify that the distribution is intently normal but it is positively skewed.

TABLE - XXV

The Percentile Scale Norms of Drag and Scoop

Norms for test items		
Mean		6.25
Median		7.00
Std. Deviation		2.18
Percentiles	3.00	3.00
	3.00	3.00
	5.00	5.00
	5.00	5.00
	7.00	7.00
	7.00	7.00
	7.00	7.00
	9.00	9.00
	9.00	9.00
	9.00	9.00

The above table shows the Percentile Scale for Drag and Scoop for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XXVI

6 - Sigma Scale for Drag and Scoop

Six Sigma Scale	Drag and Scoop
-3σ	0.3
-2σ	1.88
-1σ	4.06
σ	6.10
1σ	8.43
2σ	10.61
3σ	12.8

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XXVII.

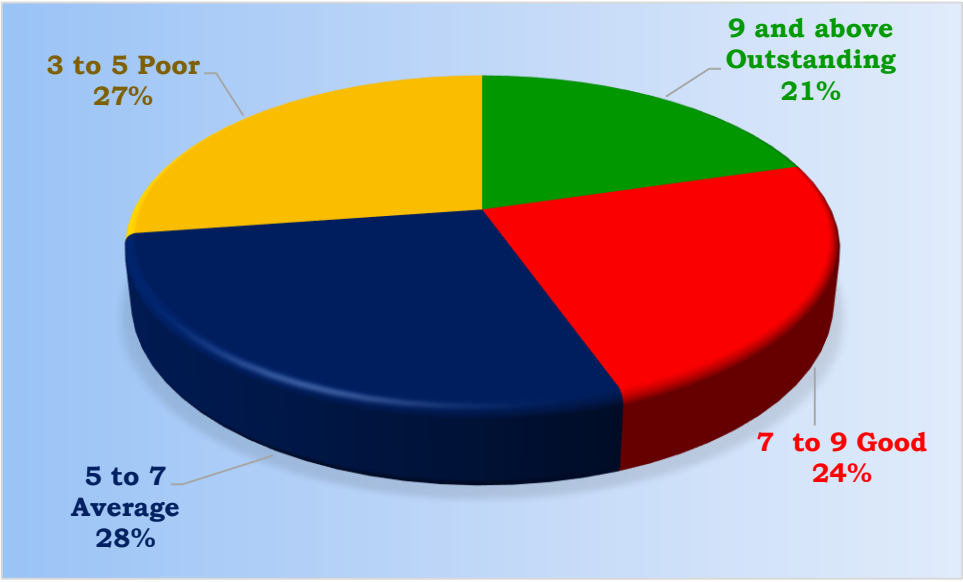
TABLE - XXVII

The Qualitative Grading for the Constructed Norms of Drag and Scoop

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**253**
7 to 9	**Good**	**300**
5 to 7	**Average**	**348**
3 to 5	**Poor**	**339**

Figure – 6b

The Pie Graph of Qualitative Grading of Drag and Scoop



As per the qualitative grading it was found that out of 1240 subjects in Drag and Scoop skill test 339 subjects (27%) were poor, 348 subjects (28%) were in average, 300 subjects (24%) were in the good category and the remaining 253 subjects (21%) were in the outstanding category.

4.3.7 RESULT ON THE NORMS OF DRIBBLE AND DRAG SCOOP

The below table – XXVIII shows the descriptive analysis of the Dribble Drag and Scoop for the variable, the mean score was 6.1 and Standard Deviation was 2.207, Std. Error of mean was 0.063, Skewness .036, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -0.776, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the

subjects is Not significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is also normal.

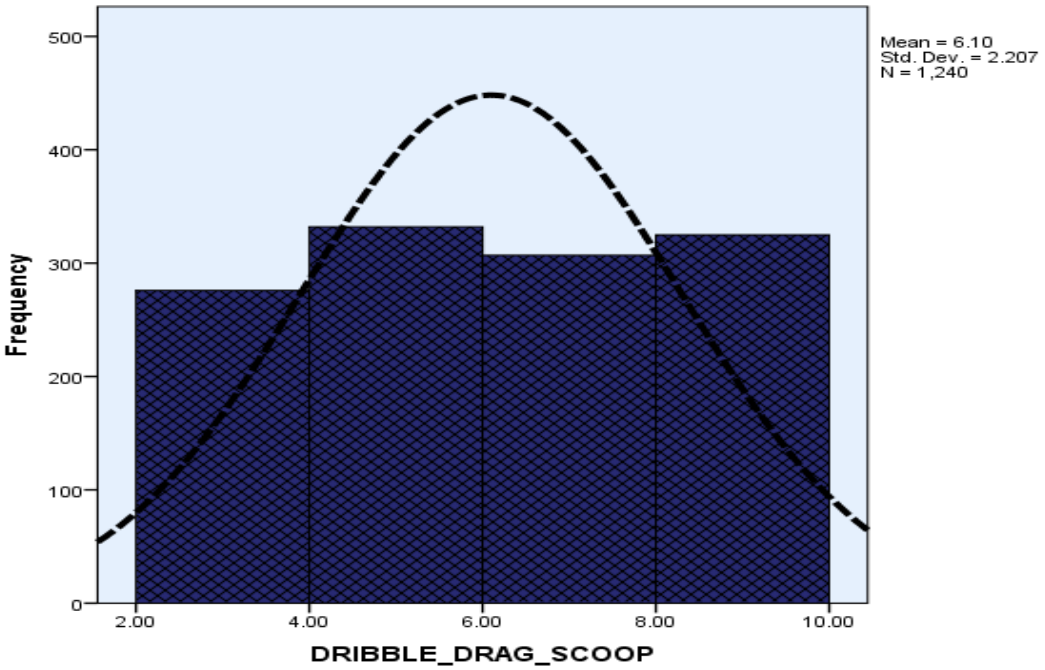
TABLE - XXVIII

Descriptive Analysis of Dribble and Drag Scoop

Statistical Measures	Distribution Characteristics of Scores in Test Item – Dribble and Drag Scoop
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.1
Std. Error of Mean	.063
Std. Deviation	2.207
Variance	4.872
Skewness	-.036
Std. Error of Skewness	.069
Kurtosis	-1.327
Std. Error of Kurtosis	.139

Figure – 7a

Histograms with Normal Curve of Dribble and Drag Scoop



To find Dribble Drag and Scoop test was administered statistical doctrine for skewness (Sk = 0.036) and Kurtosis (Ku =1.327) signify that the distribution is intently normal but it is positively skewed.

TABLE - XXIX

The Percentile Scale Norms of Dribble and Drag Scoop

Norms for test items		
Mean		6.10
Median		7.00
Std. Deviation		2.21
Percentiles	10	3.00
	20	3.00
	30	5.00
	40	5.00
	50	7.00
	60	7.00
	70	7.00
	80	9.00
	90	9.00
	100	9.00

The above table shows the Percentile Scale for Dribble Drag and Scoop for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XXX

6 - Sigma Scale for Dribble and Drag Scoop

Six Sigma Scale	Dribble and Drag Scoop
-3σ	0.5
-2σ	1.7
-1σ	3.8
σ	6.10
1σ	8.31
2σ	10.51
3σ	12.7

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XXXI.

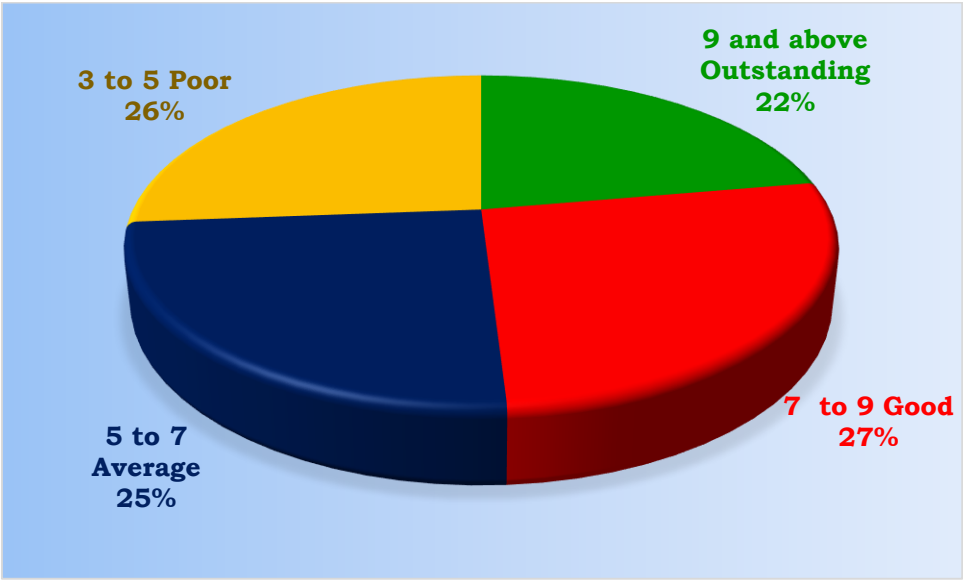
TABLE – XXX1

The Qualitative Grading for the Constructed Norms of Dribble and Drag Scoop

Scores	Alphabetical Grade	Interpretive Grade
9 and above	**Outstanding**	**276**
7 to 9	**Good**	**332**
5 to 7	**Average**	**307**
3 to 5	**Poor**	**325**

Figure – 7b

The Pie Graph of Qualitative Grading of Dribble and Drag Scoop



As per the qualitative grading it was found that out of 1240 subjects in Dribble Drag and Scoop skill test 325 subjects (26%) were poor, 307 subjects (25%) were in average, 332 subjects (27%) were in the good category and the remaining 276 subjects (22%) were in the outstanding category.

4.3.8 RESULT ON THE NORMS OF ANGLE SHOOTING

The below table – XXXII shows the descriptive analysis of the Angle Shooting for the variable, the mean score was 6.67 and Standard Deviation was 1.77, Std. Error of mean was 0.062, Skewness 0.271, std. Error Skewness 0.069, Range 6, minimum 3 points and maximum 9 points. The value of Kurtosis of the distributed scores in the test-item was -.124, which is leptokurtic in nature. Moreover, the standard error of Kurtosis (σku = 0.139) is minimum and by the subjects is Not

significant statistically even at the 0.05 level (p>0.05). These percentages of distribution showed that the curve representing the scores on this test items is also normal.

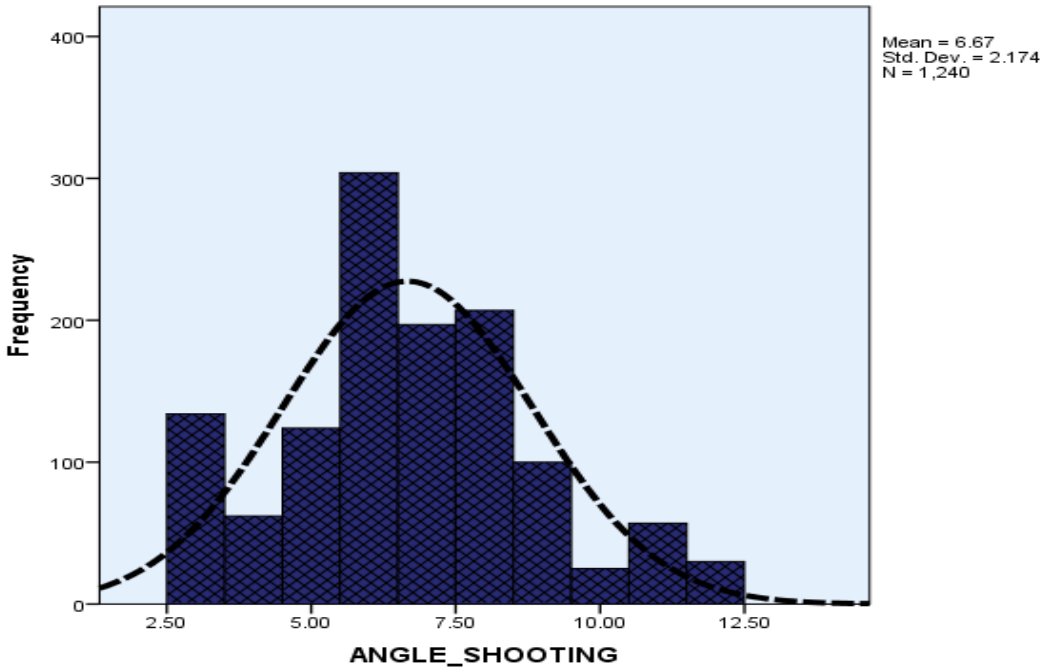
TABLE - XXXII

Descriptive Analysis of Angle Shooting

Statistical Measures	Distribution Characteristics of Scoresin Test-Item - Angle Shooting
Number	1240
Range	6
Min.	3
Max.	9
Mean	6.67
Std. Error of Mean	.062
Std. Deviation	2.174
Variance	4.728
Skewness	-.271
Std. Error of Skewness	.069
Kurtosis	-.124
Std. Error of Kurtosis	.139

Figure – 8a

Histograms with Normal Curve of Angle Shooting



To find Angle Shooting test was administered statistical doctrine for skewness (Sk = 0.271) and Kurtosis (Ku = 0.124) signify that the distribution is intently normal but it is positively skewed.

TABLE - XXXIII

The Percentile Scale Norms of Angle Shooting

Norms for test items		
Mean		6.67
Median		6.00
Std. Deviation		2.17
Percentiles	10	3.00
	20	5.00
	30	6.00
	40	6.00
	50	6.00
	60	7.00
	70	8.00
	80	8.00
	90	9.00
	100	12.00

The above table shows the Percentile Scale for Angle Shooting for hockey players that was prepared by keeping the best scores on 100th percentile and the poorest scores on 10th percentile. In 100th percentile the highest value recorded was 9 and lowest value recorded was 3 in 10th percentile.

TABLE - XXXIV

6 - Sigma Scale for Angle Shooting

Six Sigma Scale	Angle Shooting
-3σ	0.14
-2σ	2.32
-1σ	4.49
σ	6.67
1σ	8.84
2σ	11.01
3σ	13.2

On the basis of the above constructed table the subjects were given qualitative grading as shown in table – XXXV.

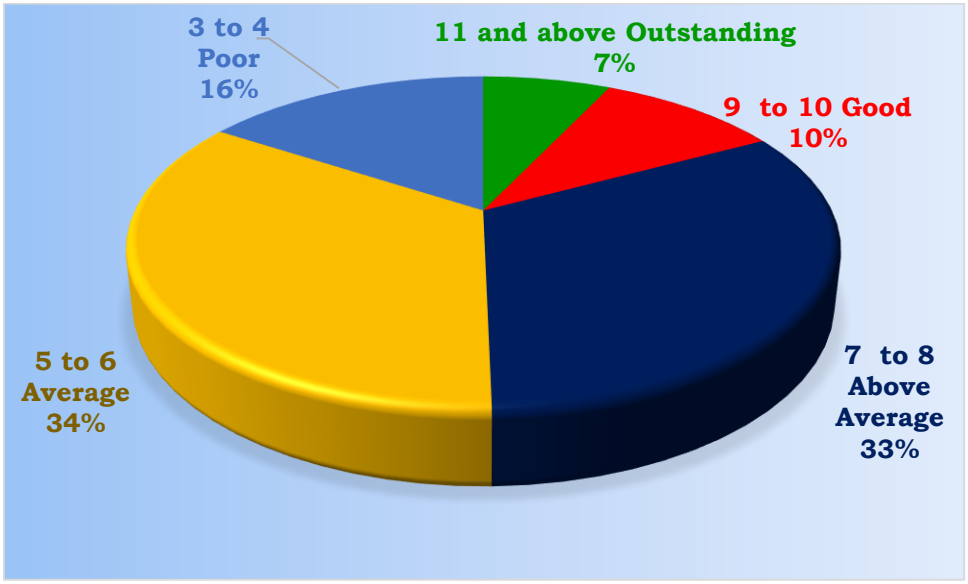
TABLE - XXXV

The Qualitative Grading for the Constructed Norms of Angle Shooting

Scores	Alphabetical Grade	Interpretive Grade
11 and above	**Outstanding**	**87**
9 to 10	**Good**	**125**
7 to 8	**Above Average**	**404**
5 to 6	**Average**	**428**
3 to 4	**Poor**	**196**

Figure – 8b

The Pie Graph of Qualitative Grading of Angle Shooting



As per the qualitative grading it was found that out of 1240 subjects in Angle Shooting skill test 172 subjects (14%) were poor, 211 subjects (17%) were in average, 334 subjects (44%) were above average, 221subjects (18%) were in the good category and the remaining 88 subjects (7%) were in the outstanding category.

4.4 DISCUSSION OF FINDINGS

Norms for hockey players of engineering college of Tamil Nadu state were constructed in terms of Percentile Scales and 6 Sigma Scale. Selected skills was tested and employed in this study. Hence players from all over the engineering colleges in Tamil Nadu who fulfill these conditions were selected for the study. The upper age group of players has been limited to 25 years. Norms for the both above test were studied thoroughly. For evaluation of players using percentile scale lower score

10 and upper score 100 and in 6-Sigma scale lower scale -3 SD and upper scale +3 SD were applied. It is concluded that percentile scale able to identify the player's position where they stands. Results in the graphical representations of 6-sigma scale indicate that maximum numbers of players are recorded in mean range and in that lower scale remain below the score. Hence, the constructed norms would be able to select the players at engineering college level.

On the whole, the results of this study were strengthening the viewpoint of the following research experts, trainees and biomechanics scientists. In the present study, the findings of the study are consistent with the several reports. Research conducted by Sunderland , et al., (2006), Bretigny, et al,, (2011) and Gemser, et al., (2004), revealed that skills are more important in playing field hockey. Gemser, et al., (2013), discriminates elite and sub-elite youth field hockey players, with reference to their technical skill. Keogh, et al., (2003), stated that dribbling and shooting accuracy can distinguish between field hockey players of varying standards. Therefore talent identification programs for field hockey should include assessments of these skill test. Previous research conducted by Geok, et al., (2012) revealed that mixed, or random practice schedules can be used effectively when structuring practice for beginners.

The pervious investigation of Video-Kerr and Ness, (2006) yielded the following coaching recommendations for enhanced push-in performance: maximize drag distance by maximizing front foot-ball

distance at the start of the push-in; use a combination of simultaneous and sequential segment rotations to optimize both accuracy and ball speed and maximize drag speed.

4.5 DISCUSSION ON HYPOTHESIS

The formulated hypothesis stated that the constructed norms would be appropriate to assess specific skills of field hockey players.

The results of the study, revealed that the norm of skill test constructed would be appropriate to assess the skills of field hockey players. Hence the hypothesis was accepted.