CHAPTER III
METHOD AND PROCEDURE

Research gives the new way to learn, to understand and to development of
new things. Construction of norms in athletics was the prime objective of the present
study, where it was need to established norms for assessing the ability of running,
jump and throwing ability of students of physical education. As this is normative
study, the researcher followed standard procedure for construction of norms, the
methodology in details, has been presented in this chapter.

3.1 SAMPLE

To achieve the objective of study 1400 students of Punjab and Chandigarh
were selected with purposive sampling technique as the subjects of the study. The
age of the subjects were ranging from 18 to 25 years. Subjects were students of
various colleges and departments of physical education of Punjab (State) and
Chandigarh (U.T).

3.2 SAMPLING RPROCEDURE

On the basis of chronological age, students were divided in two age groups of
18 to 21 and 21 to 25.

<table>
<thead>
<tr>
<th>TABLE-3.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
</tr>
<tr>
<td>Boys</td>
</tr>
<tr>
<td>Girls</td>
</tr>
<tr>
<td>Boys</td>
</tr>
<tr>
<td>Girls</td>
</tr>
<tr>
<td>N = 1400</td>
</tr>
</tbody>
</table>

Division of sample is represented diagrammatically as following:

1400
Students of Physical Education

700 Students
(Age Group 18-21 Years)

700 Students
(Age Group 21-25 Years)

400 Boys
300 Girls

400 Boys
300 Girls

3.3 SELECTION OF VARIABLES
After review of related literature, expert’s opinions and research scholar’s own experience and keeping feasibility criteria in mind following variables were selected for the purpose of the study.

**TABLE- 3.3.1**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 M Run</td>
</tr>
<tr>
<td>2</td>
<td>200 M Run</td>
</tr>
<tr>
<td>3</td>
<td>400 M Run</td>
</tr>
<tr>
<td>4</td>
<td>800 M Run</td>
</tr>
<tr>
<td>5</td>
<td>1500 M Run</td>
</tr>
<tr>
<td>6</td>
<td>5000 M Run</td>
</tr>
<tr>
<td>7</td>
<td>10000 M (Only For Boys)</td>
</tr>
<tr>
<td>8</td>
<td>110 M Hurdles (Boys) &amp;100m Hurdles (Girls)</td>
</tr>
<tr>
<td>9</td>
<td>Long Jump</td>
</tr>
<tr>
<td>10</td>
<td>Triple Jump</td>
</tr>
<tr>
<td>11</td>
<td>High Jump</td>
</tr>
<tr>
<td>12</td>
<td>Shot Put</td>
</tr>
<tr>
<td>13</td>
<td>Discus Throw</td>
</tr>
<tr>
<td>14</td>
<td>Javelin Throw</td>
</tr>
<tr>
<td>15</td>
<td>Hammer Throw</td>
</tr>
</tbody>
</table>

**3.4 RELIABILITY OF TOOLS**

To measure the performance of students in running events digital stop watch, for jumping and throwing events Freeman’s measurement tape was used. The entire instruments were of standard quality and calibrated for the authenticity and accuracy of measurements.

**3.5 TESTER COMPETANCY**

It was ensured that the research scholar and other members who helped for collection of data were competent in the measurement techniques of time and distance. The research scholar and other members also had lot of experience of officiating in various athletic meets and project meets at district, college, university and state levels, also all those who took the measurement members were working as Assistant professor/Lecturer in their respective colleges and universities.
3.6 SUBJECTS RELIABILITY

The research scholar established the reliability of test scores by using the test and re-test method on twenty five randomly selected subjects. Pearson’s product moment correlation was computed between test and retest scores of subjects. The obtained values of co-efficient correlation ensured the competency of testers and scores.

**TABLE- 3.6.1**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>VARIABLES</th>
<th>Age Group 18-21 Years</th>
<th>Age Group 21-25 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>1</td>
<td>Long Jump</td>
<td>.92</td>
<td>.97</td>
</tr>
<tr>
<td>2</td>
<td>Triple Jump</td>
<td>.96</td>
<td>.96</td>
</tr>
<tr>
<td>3</td>
<td>High Jump</td>
<td>.97</td>
<td>.98</td>
</tr>
<tr>
<td>4</td>
<td>Shot Put</td>
<td>.95</td>
<td>.96</td>
</tr>
<tr>
<td>5</td>
<td>Discus Throw</td>
<td>.97</td>
<td>.97</td>
</tr>
<tr>
<td>6</td>
<td>Javelin Throw</td>
<td>.96</td>
<td>.89</td>
</tr>
<tr>
<td>7</td>
<td>Hammer Throw</td>
<td>.95</td>
<td>.97</td>
</tr>
<tr>
<td>8</td>
<td>100 M Run</td>
<td>.98</td>
<td>.90</td>
</tr>
<tr>
<td>9</td>
<td>200 M Run</td>
<td>.83</td>
<td>.87</td>
</tr>
<tr>
<td>10</td>
<td>400 M Run</td>
<td>.95</td>
<td>.96</td>
</tr>
<tr>
<td>11</td>
<td>800 M Run</td>
<td>.96</td>
<td>.97</td>
</tr>
<tr>
<td>12</td>
<td>1500 M Run</td>
<td>.97</td>
<td>.82</td>
</tr>
<tr>
<td>13</td>
<td>5000 M Run</td>
<td>.85</td>
<td>.84</td>
</tr>
<tr>
<td>14</td>
<td>10000 M Run</td>
<td>.79</td>
<td>NA</td>
</tr>
<tr>
<td>15</td>
<td>110 &amp; 100 M Run</td>
<td>.90</td>
<td>.90</td>
</tr>
</tbody>
</table>

3.7 PROCEDURE OF DATA COLLECTION

The research scholar personally visited the colleges of physical education and department of physical education of various universities. A meeting with Principal/HOD and students of colleges and departments of various universities was held and objective of the study and procedure of tests was explained to the students and teaching faculty. Research scholar also personally requested the students to put in their best efforts during performance in athletics events.
Before conducting the tests, the entire procedure and objective of the study were explained to the subjects. In order to get the best effort from the subjects, help from professionally qualified persons and the physical education teacher of the departments was also sought. During data collection the research scholar was also present. This assistance could help to collect the data accurately. In order to make the study more reliable the research scholar informed the subjects that performing tests would help them to know their level of performance in athletics, also practice trail in each test items as per the description was ensured to each student before the actual performance measurement. Through the following test items data has been collected:

**TRACK TEST ITEMS:**

1. **Test item:** 100M Sprint.

**Objective of the test:** To measure the performance of student in 100M Sprint.

**Equipment:** Stop watches, clapper, whistle, starting blocks, number bibs and red and white flags.

**Playfield area:** Standard Athletic track/ 100M straight.

**Description of the test and procedure:** Firstly Lanes were allotted to students randomly. Students to take proper crouch start in their respective lane with the help of blocks as per the command “At your mark”, Set and Go/At whistle/clap”. Out of the two trials, best was considered. Second trial was optional.

**Scoring:** Timings was taken up to two decimals but recorded to 1/10th of second.

2. **Test item:** 200M Sprint.

**Objective of the test:** To measure the performance of student in 200 M Sprint.

**Equipment:** Stop watches, clapper, whistle, starting block, Number bibs and Red and white flags.

**Playfield area:** Standard Athletic track /200M track.

**Description of the test and procedure:** Firstly Lanes were allotted to students randomly. Students to take proper crouch start in their allotted lane with the help of blocks as per the command “At your mark”, Set and Go/at whistle/clap”. Out of the two, best trial was considered. Second trial was optional.

**Scoring:** Timings was taken up to two decimals but recorded to 1/10th of second.
3. **Test item**: 400M Sprint.

**Objective of the test**: To measure the performance of student in 400M Sprint.

**Equipment**: Stop watches, clapper, whistle, starting block, Number bibs and Red and white flags

**Playfield area**: Standard Athletic track /400M track.

**Description of the test and procedure**: Firstly Lanes were allotted to students randomly. Student to take proper crouch start from allotted lane with the help of starting block as per the command “At your mark”, Set and Go/at whistle/clap”. Out of two, best trial was considered. Second trial was optional.

**Scoring**: Timings was taken up to two decimals but recorded to 1/10th of second.

4. **Test item**: 800M Run.

**Objective of the test**: To measure the performance of student in 800 M run.

**Equipment**: Stop watches, clapper, and whistle, Number bibs Red and white flags

**Playfield area**: Standard Athletic track /400M track.

**Description of the test and procedure**: Students to take proper start from the starting line as per the command “At your mark” and Go/at whistle/clap”. Out of two, best trial was considered. Second trial was optional.

**Scoring**: Timings was taken up to two decimals but recorded to 1/10th of second.

5. **Test item**: 1500M Run.

**Objective of the test**: To measure the performance of student in 1500M run.

**Equipment**: Stop watches, clapper, whistle, starting block, Number bibs and Red and white flags.

**Playfield area**: Standard Athletic track /400M track.

**Description of the test and procedure**: Students to take standing start from the starting line as per the command “At your mark” and Go/at whistle/clap”. Out of two, best trial was considered. Second trial was optional.

**Scoring**: Timings was taken up to two decimals but recorded to 1/10th of second.

6. **Test item**: 5000M Run.
**Objective of the test:** To measure the performance of student in 5000M run.

**Equipment:** Stop watches, clapper, whistle, starting block, Number bibs and Red and white flags.

**Playfield area:** Standard Athletic track /400M track.

**Description of the test and procedure:** Students to take standing start from the starting line as per the command “At your mark” and Go/At whistle/clap”. In this event 12.5 rounds of 400 M track was performed by the student. Adequate lap scorers were deputed for lap scoring. Lap scoring was date at the lap scoring sheet.

**Scoring:** Timings was taken up to two decimals but recorded to 1/10\(^{th}\) of second.

7. **Test item:** 10000M Run.

**Objective of the test:** To measure the performance of student in 10000 M run.

**Equipment:** Stop watches, clapper, whistle, Number bibs, and Red and white flags.

**Playfield area:** Standard Athletic track /400 Ms track.

**Description of the test and procedure:** Students to take standing start from the starting line as per the command “At your mark” and Go/at whistle/clap”. In this event twenty five rounds were taken by each student. Adequate lap scorers were deputed for lap scoring. Lap scoring was date at the lap scoring sheet.

**Scoring:** Timings was taken up to two decimals but recorded to 1/10\(^{th}\) of second.

8. **Test item:** 110&100M Hurdle.

**Objective of the test:** To measure the performance of student in 110 & 100M hurdles.

**Equipment:** Stop watches, clapper, whistle, starting block, Number bibs and Hurdles.

**Playfield area:** Standard Athletic track /400M track.

**Description of the test and procedure:** Students to take crouch start from the starting line as per the command “At your mark” and Go/whistle/clap”. Lead leg and trail leg action was performed at hurdles accordingly and performance was recorded.

**Scoring:** Timings was taken up to two decimals but recorded to 1/10\(^{th}\) of seconds.

**FIELD TEST ITEMS:**
1 Test item: Long Jump

Objective of the test: To measure the performance of student in Long jump.

Equipment: Measuring tape, Number bibs, Nails white and Red flags and whistle.

Playfield area: Long jump pit with proper runway.

Description of the test and procedure:

The landing pit with the length of 9 to 10 Ms and 2.75 to 3 Ms wide has been used. Take off board was fixed, three M behind the pit. The length of runway for the long jump would be 35-40 Ms with good running condition. The subjects were asked to do the proper warm up to give best performance.

The researcher/official has called the students one by one. Student should take the jump from take-off board with maximum effort to cover the maximum distance. The measurement was taken from the nearest point made by any part of the subject's body. Student to take two trials and best was considered. Second trial was optional.

Scoring - A student has taken two trials and best was considered. Second trial was optional. The best distance of jump was recorded in meters and centimeters.

2 Test item: Triple Jump

Objective of the test: To measure the performance of student in Triple jump.

Equipment: Measuring tape, Number bibs, Nails, white and Red flags and whistle.

Playfield area: Triple jump pit with proper runway.

Description of the test and procedure: The landing pit with the length of 9 to 10 Ms and 2.75 to 3 Ms wide has been used. Take off board was fixed, three M behind the pit. The length of runway for the triple jump would be 35-40 Ms with good running condition. The subjects were asked to do the proper warm up to give best performance. The researcher/official has called the students ate by ate. Student had taken proper hop step and jump from take-off board with maximum effort to cover the maximum distance. The measurement was taken from the nearest point made by any part of the subject's body. Student took two trials and best was considered. Second trial was optional.

Scoring: Measurements were recorded in meters and centimeters.
3 Test item: High Jump

Objective of the test: To measure the performance of student in High jump.

Equipment: High jump pit, Crossing bar, uprights, Measuring tape, Number bibs, Nails, Red and white flags and whistle.

Playfield area: High jump pit with sufficient runway.

Description of the test and procedure: A proper high jump pit, up-rights and cross-bar was used. The subjects were asked to do the warm up to give best performance. The height of the cross bar was announced to the subjects and call was made to perform high with single leg take off. Students took the attempts until any of them failed to clear height in two chances. Student took two trials and best was considered.

Scoring: Measurements were recorded in meters and centimeters.

4 Test item: Shot Put

Objective of the test: To measure the performance of student in Shot Put.

Equipment: Measuring tape, Shot, Number bibs, Nails, Red and white flags and whistle.

Playfield area: Shot Put sector.

Description of the test and procedure: Proper marked circle with diameter of 2.135 Ms and angle of 34.92° was used. The weight of the shot was 7.26 kilogram and 5 kilogram for boys and girls respectively. The subjects were asked to warm up to give best performance. Attempt for putting the shot was based at Perry-O’Brien or disco-put technique. Two attempts were given to each subject and best performance was recorded. The distance was measured from the nearest mark made by the shot in the throwing sector.

Scoring: All the measurements were recorded in meters and centimeters.

5 Test item: Discus Throw.

Objective of the test: To measure the performances of student in Discus throw.

Equipment: Measuring tape, discus, Number bibs, Nails, Red and white flags and whistle.

Playfield area: Discus circle and throwing sector.
**Description of the test and procedure:** Student to take the position in Proper marked circle with diameter of 2.50 Ms and angle of 34.92°. The weight of the discus was 2 kilogram and 1 kilogram for boys and girls respectively. The subjects were asked to warm up to give best performance. Two attempts were given to each subject and best throw was recorded. The distance was measured from the nearest mark made by the discus in the throwing sector.

**Scoring:** All the measurements were recorded in meters and centimeters.

6 Test item: Javelin throw.

**Objective of the test:** To measure the performance of student in Javelin.

**Equipment:** Measuring tape, Javelin, Number bibs, Nails, Red and white flags and whistle.

**Playfield area:** Javelin throwing sector.

**Description of the test and procedure:** Proper 4 meter Wide and 30-35 Ms lengthy runway with sector angle of 28.95° was used. The prescribed weight of javelin for boys was 800 grams and 600 grams for girls. Before the test, boys and girls were asked to perform the needful warm-up, to give best performance. Only index finger grip and horse shoe grip was used for throw. The javelin must fall within the sector and the tip of the javelin must touch the ground. The valid throw was measured from the nearest mark made by the fall of javelin in throwing sector. Student took two trials and best was considered. Second trial was optional.

**Scoring:** All the measurements were recorded in meters and centimeters.

7 Test item: Hammer throw.

**Objective of the test:** To measure the performance of student in Hammer.

**Equipment:** Measuring tape, hammer, Number bibs, Nails, Red and white flags and whistle.

**Playfield area:** Hammer throws circle and sector.

**Description of the test and procedure:** Proper marked circle with diameter of 2.135 and angle of 34.92° was used. The weight of the hammer was 7.26 kilogram and 5 kilogram for boys and girls respectively. The length of a chain of hammer was 117.7 to 121.5 for men and 116 cm to 119.5 for women and diameter of ball was 110mm.
to 130 mm for men and 95 mm to 110 mm for women. The subjects were asked to warm up to get good performance. Two attempts were given to each subject and best put was recorded. The distance was measured from the nearest mark made by the fall of hammer in the sector. Students took two trials and best was considered. Second trial was optional.

**Scoring:** All the measurements were recorded in meters and centimeters.

### 3.8 Statistical Techniques

For construction of norms and to compare different groups on test items following statistical tool were used in this study:

i. **Mean**

ii. **Standard Deviation**

iii. **T-Scale**

iv. **Percentile**

v. **Sigma Scale, Hull scale**

vi. **T-test and for analysis of data software SPSS for window (16.0 Version) and Microsoft Excel 2003 were used.**