CHAPTER III

METHODOLOGY

The investigator has undertaken this present study with a view to study the sports talent identification factors of Himachal Pradesh boys. In this scientific inquiry, data collection was the next sequential step after defining the problem and formulation of the hypothesis. The detailed methodology of research design and data collection followed by researcher during investigation of the problem is presented in this chapter.

3.1 Research Design

The accuracy in results and quality of research findings depend mainly upon the research design. Research methodologist like Edwards (1968)\(^1\), Winer (1971)\(^2\), kerlinger (1978)\(^3\) and many others considers research design as a controlled mechanism ruled by the principal of “Max Con Min.” The ‘max’ explains the investigator to go for ‘maximizing of systematic variance’ whereas the ‘con’ explains to exercise the control over unwanted variables and ‘min’ gives an understanding to minimize error variables so as to ensure disciplined data that contribute to a sound generalizations. While
verifying research hypothesis, a properly designed research tells what to do and what not and indicates the steps to be taken in sequential manner for collecting the empirical data.

Selecting a proper research design and justifying its relevance, the researcher further moved for its relevance, the researcher further moved for its implication with a view to testing the hypothesis.

Present investigation is a survey cum normative study.

### 3.2 The Population & Sample

#### 3.2.1 The Population

Population for the present study was 12, 13, 14 years school going boys of Himachal Pradesh.

#### 3.2.2 Sample

The primary purpose of the research is to discover principles that have universal application. Therefore, arriving at sound inferences and findings, known as generalizations applicable to the population, has become the target in this study. But to study a whole population for arriving at generalization is impossible in maximum cases. Thus,
in the present investigation instead of studying the entire population, the sample drawn has been studied.

The major task in a sampling is to select a sample from defined population by an appropriate technique that ensures that sample is representative of the population and as far as possible not biased in any way. Sample must be adequate large in size so that power of generalization of the findings seems to be high and accurate in estimating the properties of the population.

Considering these points, stratified random sampling technique has been employed, to 3160 boys studying in the High schools of Himachal Pradesh Pradesh.

The study was confined to the 12, 13 and 14 years school going boys of Himachal Pradesh. The names of all the Districts of Himachal Pradesh were listed on the basis of region wise locations. Considering the altitude of the area viz, Inner Himalayan and Lower Hilly, two strata were set. Ten schools from each region selected randomly from each strata. Thus 20 schools were listed as sample. Then investigator then collected the name list of boys studying in the school specially whose age falls in the range of 12 to 14 years.
From this list, the boys selected for this study by applying Fisher’s Random sampling technique without considering caste, creed and colour. Total three thousand one hundred sixty (n=3160), were selected for this study from Himachal Pradesh. 1580 of inner Himalayan and same from lower Hilly area were selected randomly.

Three thousand one hundred sixty (n=3160) school going boys, age from 12 to 14 years, were selected for this study from Himachal Pradesh. 1580 of inner Himalayan and the same from lower Hilly area were selected. The subjects were selected on the basis of stratified random sample technique\(^4\).

### 3.3 Variables Selected & Tools Used

SAI National Sports Talent Contest Battery was used for the collection of data.\(^5\) The same battery of tests is also being used by the state government of Himachal Pradesh under the H.P Govt. sports policy for the selection of talented boys and girls for admission to sports hostels which have been established by HP Government and SAI. Further from 1989 the talent scouting was done by applying the said battery of tests to assess the physical development, motor qualities. The battery of tests for this purpose was formulated in consultation with the soviet experts and later
adopted to Indian conditions. The battery helps to assess the motor qualities like speed, explosive power, Strength, endurance, agility, flexibility and body coordination. The battery consists of the tests as given below:

**Anthropometric Variables** (viz; Standing Height and Weight). Were assessed by SAI National Sports Talent Contest Battery Test.

**Motor Ability Variables** (viz; Speed, Explosive Strength of Legs, Explosive Strength of Legs and Extensibility of Hip Muscle, Agility, Explosive Strength of Arms, Flexibility, and Endurance). Were assessed by SAI National Sports Talent Contest Battery Test.
Table No 3.1

SAI National Sports Talent Contest Battery

<table>
<thead>
<tr>
<th>Test items</th>
<th>Sports Talent factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Height</td>
<td>1. Anthropometric</td>
</tr>
<tr>
<td>2. Weight</td>
<td>2. Anthropometric</td>
</tr>
<tr>
<td>3 30 meter flying start</td>
<td>3. Speed</td>
</tr>
<tr>
<td>4. Standing broad jump</td>
<td>4. Explosive Strength of Legs</td>
</tr>
<tr>
<td>5. Standing vertical jump</td>
<td>5. Explosive Strength of Legs and extensibility of Hip Muscles</td>
</tr>
<tr>
<td>6. 6 x 10 meter shuttle run</td>
<td>6. Agility</td>
</tr>
<tr>
<td>7. Medicine ball put</td>
<td>7. Explosive Strength of Arms</td>
</tr>
<tr>
<td>8. Flexibility Test (Bend &amp; Reach)</td>
<td>8. Flexibility</td>
</tr>
<tr>
<td>9. 800 meter Run</td>
<td>9. Endurance</td>
</tr>
</tbody>
</table>
3.4 Criterion measures of Variables and Reliability of Data, Subject & Testers

3.4.1 Criterion of Anthropometric Measurements:

a) **Height:**
   Was measured with the help of vertical scale fixed with the wall and measurement taken nearest centimeter.

b) **Weight:**
   Body weight measured with the help of a digital weighing machine nearest 0.1 Kg.

3.4.2 Criterion of Motor Ability Measurements:

a) **Speed** was tested by 30 M flying start and the performance was recorded nearest 1/100th of a second.

b) **Explosive strength of the leg** was assessed using standing Broad jump test. The distance was recorded nearest 0.5 cm.
c) **Explosive strength of legs and extensibility of hip muscles** was assessed by using standing vertical jump test recorded in centimeters.

d) **Agility** was measured by using 6 x 10 M shuttle run test and the performance was recorded nearest 1/100\(^{th}\) of a second.

e) **Flexibility** measured by forward bend and reach test measured in cms.

f) **Explosive strength of the arms** was measured by medicine ball put test. Performance was recorded in cms.

g) **Cardiovascular Endurance** was assessed with the help of 800 M run test and performance was recorded nearest to 1/100\(^{th}\) of a second.
<table>
<thead>
<tr>
<th>Tests</th>
<th>Criterion Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Weight</td>
<td>1. Kilograms</td>
</tr>
<tr>
<td>2. Height</td>
<td>2. Centimeters</td>
</tr>
<tr>
<td>3. 30m flying start</td>
<td>3.1/100 of a sec.</td>
</tr>
<tr>
<td>4. Standing broad jump</td>
<td>4. Centimeters</td>
</tr>
<tr>
<td>5. Vertical jump</td>
<td>5. Centimeters</td>
</tr>
<tr>
<td>6. 6x10m shuttle run</td>
<td>61/100 of a sec.</td>
</tr>
<tr>
<td>7. Medicine ball put</td>
<td>7. Centimeters</td>
</tr>
<tr>
<td>8. Flexibility tests</td>
<td>8. Centimeters</td>
</tr>
</tbody>
</table>
| 9. 800m run                | 10. Minutes &1/100  
                             | Of a sec.           |

3.4.3 Reliability of data & Subjects, Reliability

The subjects’ reliability was established using ‘test-retest’ coefficient of correlation method where the scores obtained from said test-items were involved. The gap between the test and retest was minimum of 20 days. However, retest was completed upon 10
% of the total target sample. Person’s product moment method was employed to find out the relationship between the scores of the first and measurement of the subjects in each test was determined.

Test- retest reliability coefficient of samples on the test-item of the Anthropometric variables were recorded 0.84 to 0.89, and Motor Ability as 0.83 to 0.89

3.4.4 Testers’ Reliability

Two scholar of M.Phil (Physical Education) and three Physical Education experts with one NIS Coach assisted in collecting data on different items. The assistant was oriented with training in the procedures of accurate measuring and recording the scores in each test. After the specialized training all the assistants were asked to measure the performance of 30 subjects in each specified test on trial basis. The tester’s reliability coefficients in each specified test on trial basis. The tester’s ability co-efficient was determined statistically, which were ranged from 0.88 to 0.93. It is interesting to note that all the coefficients were found statistically significant at the 0.01 levels. Therefore, the final measurements taken with the help of these assistances were considered reliable.
3.5 DESCRIPTION OF THE TESTS

3.5.1 Anthropometric Measurements

3.5.1.1 HEIGHT (fig.3.1)

Test aim: To measure the standing height.

Equipment: Height measuring Stand or marking on the wall.

Procedure: The subject stands erect bare-foot with heels and back of the head touching the stand or wall. The device of measurement stand or a flat cardboard is put up on the top of the head to take the height of an individual.

Score: The measurement is taken to the nearest centimeter.

3.5.1.2 Weight (fig.3.2)

Test Aim: To assess the body mass.


Procedure: The subject stands on the platform of the weighing machine barefooted with foot parallel and weight equally distributed on both the feet with minimum cloth worn like vest and short.
Score: The weight is recorded from the indicator dial of the machine in kilograms.

3.5.1.3 Motor Ability Test

3. 30 M Flying Start (fig.3.3)

Test aim: To measure the maximum speed.

Equipment: Stopwatch (1/10th of a second) and six flags posts, 45 M running strip, measuring tape.

Marking: 45 M distance is divided into two zones of 15 m and the other of other of 30 m Say F.A & B is of 15 m and AB is of 30 m. Take radius of 30 m and mark an arc from point A. mark another arc of 30 m from point B and intersecting at point c. Join CA and extend to D. Fix flags at all these six points viz., A, B, C, D, E, & F.

PROCEDURE: The performer stands behind the line F and accelerates and crosses the line B with maximum possible speed.

Score: The time keeper stands on point C and when the runner comes in line with flag A and E, he starts the watch and when the torso of runner comes in line B&D he stops the stop watch. The time is then noted down from the watch.

Note: Participants are not permitted to run with spikes and running area should be Firm and non-slippery.
3.5.1.4 STANDING BROAD JUMP (fig.3.4)

Test Aim: To measure the explosive strength of the legs.

Equipment: measuring tape, a leveled long jump pit with the take off line

Marking: a line is marked near the edge of the jumping pit

Procedure: the performer stands behind the take off line with feet together. He flexes his knees, takes arms raising the heels a little and along with a vigorous forward and upward arm swing he extends the knees into the jumping pit to cover the maximum horizontal distance.

Score: The distance covered in centimeters between the take off line and nearest landing mark is measured. The score will be best of three trials.

3.5.1.5 MEDICINE BALL PUT: (fig.3.5)

Test aim: To measure explosive strength of arms and shoulders’

Equipment: Medicine ball of 1 kg for up to 10 years, 2 kg. for 11 and above and steel measuring tape.

Procedure: The subject sits in the center of the shot put throwing circle with his legs stretched forward comfortably touching the toe board. Legs should also be comfortably apart. His spine should be in line with the centre of the circle. From this position he puts the
medicine ball up and forward as far as possible with both his hands. The put should be made from the chest outwards. Three attempts are permitted.

**Score:** The distance of the put is measured with a steel tape from the centre of the circle to the nearest mark made by the medicine ball on the ground. The radius of the circle is deducted from the distance measured. The best distance is taken as the score.

3.5.1.6 6X10 M SHUTTLE RUN (fig.3.6)

**Test aim:** to determine the agility of the subject.

**Equipment:** Stop watch lime powder

**Marking:** 10 m of distance is marked by two parallel lines

**Procedure:** the test should be conducted on a leveled surface with running lanes marked on it. Two subjects should do the test together. The subject should stand behind the starting line with one foot forward. On the signal “go” they sprint to the opposite line and cross it, at least with one foot, and sprint back to the starting line. In this manner they complete 6x10 m shuttle sprints. The time keepers stand beside the starting line and take the time taken to finish the shuttle run. Two attempts are permitted with sufficient recovery between each attempt. The best time is taken as the score of the subject.
**Score**: The time taken by the performer to complete the course 6x10 M to the nearest 1/10th of a second is recorded score of the test. Only one chance is given.

### 3.5.1.7 Forward Bend and Reach (Fig.3.7)

**Test Aim**: To Measure the flexibility of the subject.

**Equipment**: Test should be conducted on suitable wooden box 40 cm.height on one side of the box scale 0-30 cm.is marked.

**Procedure**: Subjects stand bare foot on the box with both feet together with toes in line with the edge of the box. From this position he bends forward and downward while keeping his knees strength. He extends his hands along the scale as down as possible. Both the hand should be parallel at maximum reaches he holds the position for about two seconds.

**Score**: The result is read from the scale. Two attempts are given at recovery rest of 30 seconds. In case a subject is not able to extend his hand even to the level of box then the distance from the 0 cm marked to the tip of middle finger should be measured with the scale and recorded as negative score.

### 3.5.1.8 VERTICAL JUMP (fig.3.8)

**Test aim**: To test the explosive strength of legs and extensibility if hip muscles
**Equipment:** Duster, chalk powder, measuring tape, chair and bench

**Marking:** A vertical wall is prominently marked in centimeters up to 3.25 Mt.

**Procedure:** The performers dips his fingers in chalk powder and stands side-wise against the wall keeping the arm raised completely above the head and clap the extended hand marked with chalk on fingers straight. Then he jumps as high as possible and touches the wall. The reading is noted by keeping eyes in level with the chalk mark on the graduated marking.

**Score:** The standing reach is subtracted from the jumping reach. The score will be the best of three jumps.

**3.5.1.9 800M. Run:** (fig.3.9)

**Aim:** To measure the endurance.

**Equipment:** stop watch, running track or measured play field.

**Procedure:** The 400 m distance is marked on the field or a marked 400m track can be used where curve start is to be given.

**Score:** The time to cover the 800 M distance to nearer 1/10\(^{th}\) of a second is recorded as score of the test.
3.6 Source of Data and data Collection

The study was confined to the 12, 13 and 14 years school going boys of Himachal Pradesh. The names of all the Districts of Himachal Pradesh were listed on the basis of region wise locations. Considering the altitude of the area i.e., Inner Himalayan and Lower Hilly, two strata were set. Ten schools from each region selected randomly from each strata. Thus 20 schools were listed as sample. Then investigator then collected the name list of boys studying in the school specially whose age falls in the range of 12 to 14 years. From this list, the boys selected for this study by applying Fisher's Random sampling technique without considering caste, creed and colour. Total three thousand one hundred sixty (n=3160), were selected for this study from Himachal Pradesh. 1580 of inner Himalayan and same from lower Hilly area were selected randomly. The investigator has collected the relevant data for two years from the boys of both region.

3.7 Statistical Techniques used

Following statistical tools were used for the data analysis:
- The data was analyzed using the following statistical techniques. Mean SD, QD, Skewness, Kurtosis, and Standard error of Skewness, and Standard Error of Kurtosis.

- T test was used to compare the sports talent performance Inner Himalayan and Lower Hilly area boys. The sports talent score of the individual were also compared.

- Percentiles norms have been established to search the sports talent from Himachal Pradesh Area wise.

- A statistical software SPSS (11.5 version) was used for the data Analysis.
Fig. 3.1 Height (cm)
Fig. 3.2 Weight(cm)
Fig. 3.3 30 m. Flying Start (Sec.)
Fig. 3.4 Standing Broad Jump(cm)
Fig. 3.5 Medicine Ball Put. (cm)
Fig. 3.6 6x10 Mt. Shuttle Run. (Sec.)
Fig. (3.7) Forward Bend & Reach (cm)
Fig. 3.8 Vertical Jump (Initial Stage)

Fig. 3.8a Vertical Jump (Final Stage)
Fig. (3.9) 800 mt. Run. (Min. & Sec.)
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