CHAPTER III

METHODOLOGY

The aim of the study was to find out The Interrelationship among Motor Fitness Nutritional Status Academic Achievement and Sports Participation of High School Boys. The objectives of the present study have been listed in the first chapter of thesis. To achieve the aims and objectives of the study there was a need for selection of subjects, samples, samplings techniques, tests and measurements for the collection of related data. In this chapter the research scholar has described the procedure and method that were adopted in this study.

Selection of Subjects

For the purpose of present study seven hundred eleven (N=711) high schools boys were selected in Mysuru district. The total subjects were randomly selected from urban area schools and rural area schools of Mysuru district. From Urban area school three hundred seventeen (317) and from rural area school three hundred ninety four (394) students were selected for the study. Only sports participating high schools boys ranging in age between 14-16 years were selected for the present study. The schools which come under Grama panchayath limitations were considered as rural schools and the schools which come under Town Municipal and Mysore City Corporation were considered as urban schools. The high school boys of Mysore district who participated in any sports activities at school level competitions were considered as sports participating high school boys.
### Table-1

**Selection of the Schools**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Urban Schools</th>
<th>Rural Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>St. Joseph High school, Mysuru</td>
<td>Government High school Mullur, Hunsur Taluk</td>
</tr>
<tr>
<td>3.</td>
<td>Maharaja Government High school, Mysuru</td>
<td>Bharath Matha High school, Koppa, Periyapatna Taluk</td>
</tr>
<tr>
<td>4.</td>
<td>Pushpa Convent, Periyapatna</td>
<td>Government High school Beechanahalli, H D Kote Taluk</td>
</tr>
<tr>
<td>5.</td>
<td>Government High school, K.R. Nagar</td>
<td>Government High school, Hirehalli, H D Kote Taluk,</td>
</tr>
<tr>
<td>6.</td>
<td>K T E S High School, Bannur</td>
<td>Government High school, Hediyal, Nanjangud Taluk</td>
</tr>
<tr>
<td>7.</td>
<td>----</td>
<td>Government High school, Menasikyathanalli, T Narasipura Taluk</td>
</tr>
<tr>
<td>8.</td>
<td>----</td>
<td>Government High school, Rathnapuri, Husur Taluk</td>
</tr>
</tbody>
</table>

**Selection of Variable for the Study**

After a thorough review of literature related to the study in books, journals, periodicals and research articles besides detailed discussion with the experts and keeping in view of the feasibility of the study in terms of availability of equipment and the relevance of the variables to the present study, the variables selected were shown in the below tables.
### Table-2

**Motor Fitness Variables and Criterion Measures**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Indiana Motor Fitness Test Variables</th>
<th>Motor Fitness Variables</th>
<th>Criterion Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chin-ups</td>
<td>Arm and Shoulder Girdle Strength Endurance</td>
<td>Maximum numbers</td>
</tr>
<tr>
<td>2</td>
<td>Push-ups</td>
<td>Arm and Shoulder Girdle Strength Endurance</td>
<td>Maximum numbers</td>
</tr>
<tr>
<td>3</td>
<td>Standing broad jump</td>
<td>Leg power</td>
<td>Centimeters</td>
</tr>
</tbody>
</table>

### Table-3

**Other Study Variables Tools and Criterion Measures**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Study Variables</th>
<th>Tools</th>
<th>Criterion Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nutritional Status</td>
<td>NCHS Standards (IAP)</td>
<td>Percentile value</td>
</tr>
<tr>
<td>2</td>
<td>Academic Achievement</td>
<td>Obtained marks</td>
<td>Grade Point / Percentage</td>
</tr>
</tbody>
</table>

The researcher was collected all above the data by using questionnaire and test administration method.

**Orientation of the Subjects**

The researcher himself contacted the subjects individually in their respective schools to get the full co-operation from the subjects. Before the administration of the tests all the subjects were clearly and thoroughly oriented about the test procedure and
purpose of the study. Researcher also explain the warming-up procedure needed for the Motor fitness tests.

**Procedure of Collection of Data**

The investigator was personally visited the all schools. Tests were administered in three sessions on two consecutive days with the help of physical education teachers and coaches in their respective schools. Motor fitness tests and Nutritional Status was administered in the morning and evening between 8 am to 10 am and between 3.30 pm to 5.30 pm. The questionnaire scales are administered in the afternoon session. Before the respondents answered the questionnaire, the researchers gave a short briefing to explain the purpose of the study and how to answer the questionnaire. It was stressed that all information obtained would be confidential and used only for research purposes. After students had completed the questionnaire, the researcher and his assistants collected the questionnaire. The investigator himself administrated all the tests and tools, the selected study variables were measured according to the proper procedure and instructions available in the literature.

**TEST ADMINISTRATION**

The following tests were administered to measure the Motor fitness variables, Nutritional Status, Academic Achievement and Sports participation of the high school boys. The method of data collection is explained following.
MOTOR FITNESS VARIABLES

INDIANA MOTOR FITNESS TEST

1. PUSH-UP

**Purpose:** Measurement of Strength Endurance of Arm and Shoulder Girdle

**Possible equipment required:** A floor mat or Cleaned wooden/cement surface

**Procedure:** The subject begins push up with the hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder width apart, extended and at right angles to the body. Keeping the back and knees straight, the subject lowers the body to a predetermined point, to touch some other object, or until there is a 90-degree angle at the elbows, then returns back to the starting position with the arms extended. This action is repeated, and test continues until exhaustion, or until they can do no more in rhythm or have reached the target number of push-ups.

**Scoring:** Record the number of correctly completed push-ups.

Figure 1: Push-up test
2. CHIN-UP

**Purpose:** Measurement of Strength Endurance of Arm and Shoulder Girdle

**Equipment and Materials:** The equipment needed is a horizontal bar (11/2 inches in diameter) raised to a height so that the tallest performer cannot touch the ground from the hanging position.

**Directions:** The Performer should assume the hanging position with the overhand grasp (palms forward) and pull his body upward until the chin is over the bar. After each chin-up he should return to a fully extended hanging position. The exercise should be repeated as many times as possible.

**Scoring:** The Score is the number of completed chin-ups.

![Figure 2: Chin-up Test](image-url)
3. STANDING BROAD JUMP

**Purpose:** To measure the power of the legs while jumping forward.

**Facility and equipment:** Outdoor jumping pit with takeoff board and measuring tape.

**Procedure:** The subject with feet apart stands behind the takeoff line which was marked on the back of the jumping pit. The subject dips at knee, arms backward and leaps forward to land inside the pit.

**Scoring:** Measurement from the point of part the body touching the pit to the nearest point on the takeoff line was measured and recorded in meter and centimeters.

*Figure 3: Standing broad jump test*
NUTRITIONAL STATUS

Nutritional status of urban and rural sports participating high school boys was assessed by Anthropometric measurement such as weight and height. As suggested by World Health Organization (WHO), Indian Academy of Pediatrics’ (IAP) classification was used to assess nutritional status of Indian school children (Indian Pediatrics, 1972).

The most widely used system is World Health Organization (WHO) classification based on Z-scores In India, the Indian Academy of Pediatrics (IAP) classification is widely used. Indian Academy of Pediatrics is the reference for the assessing Nutritional Status of the children, as per NCHS 50th percentiles for Indian children. Integrated Child Development Scheme (ICDS) is also following IAP classification for judging Nutritional Status of preschool to high school children. Therefore it is appropriate use IAP classification to assess Nutritional Status of High School children.

Nutritional Status According to IAP classification (Weight for Age)

- Normal Above 80
- First grade (Grade I) malnutrition 71 -80
- Second grade (Grade II) malnutrition 61-70
- Third grade (Grade III) malnutrition 51-60
- Fourth grade (Grade IV) malnutrition Below 50
Normal: Children who are all assessed as Normal nutrition

Grade I: Mild Malnutrition

Grade II: This malnutrition is also called as moderate malnutrition

Grade III & IV nutrition is considered as Sever and highly or extremely malnutrition

National Centre for Health Statistics (NCHS) 50% value are 100% corresponding to the actual (weight for age) value, are calculated for classifying different grade of malnutrition.

Figure 4: Administering Nutritional Status Test
HEIGHT

**Purpose:** To measure the standing height.

**Equipment:** Stadiometer

**Procedure:** The standing height of subjects was measured with the student standing erect without shoes and socks on the floor of Stadiometer. The subject was asked to stand with heels, buttocks and back touching the vertical scale of Stadiometer and head oriented in F.H Plane. The subject was asked to take deep breath and stand still, till the measurement was taken. A stiff wooden foot scale was held vertically on the landmark vertex, slightly pressing the subject's head and touching the Stadiometer at a right angle. The subject was asked to step out from the Stadiometer by lowering the head and the reading indicated by the lower end of the wooden scale on Stadiometer graduations was recorded to the nearest centimeter.

**Scoring:** The height of the student was read and recorded in whole centimeters.

![Figure 5: Height measurement](image)
WEIGHT

Purpose: To measure the human body weight.

Equipment: A weighing machine.

Procedure: Each subject was taken on a portable weighing machine. The subject was asked to wear only minimum clothing and be bare footed. The accuracy of the weighing machine was checked at intervals with standard weights. Before taking the measurements, care was taken to see the pointer of weighing machine stood at zero when there was no weight on it.

Scoring: The weight of the subject is recorded to nearest half of a kilograms.

Figure 6: Weight measurement
**Calculation of Age**

Age can be calculated based on the date of birth. Cronanical age calculated from birth date to till date. For example birth date of a student is 10-02-2000 and his age as on 10-08-2014 is 14 years 6 months. The age of the children was determined using school records.

**Academic Achievement**

Academic achievement of the students was taken from the records of the respective schools. The Academic Achievement of the students was considered based on the average percentage of marks obtained by each student in the mid–term / annual examination conducted during the concerned academic year

**STATISTICAL ANALYSIS**

The data collected were later subjected to statistical analysis using descriptive statistics like frequency and percentages, mean and standard deviations. Inferential statistics included in the present study are Cramer’s V, ANOVA-one way and two-way, and Scheffe’s post hoc test. Along with descriptive and inferential statistics, graphical presentations have been depicted wherever necessary.