CHAPTER-III

METHODOLOGY

The procedure adopted for selection of subjects, selection of variables and tests, pilot study, reliability of data, instrument reliability, tester's reliability, subject reliability, orientation of the subjects, administration of test and the statistical techniques employed for the present study have been discussed in detail in this chapter.

SELECTION OF SUBJECTS

The purpose of this study was designed to analyse motor fitness and socio-economic status between rural and urban school boys of Union Territory of Pondicherry. To achieve these purpose 400 boys from rural schools and 400 boys from urban schools were selected at random in various schools of Puducherry, Karaikal, Mahe and Yanam. Their age range from 12 to 14 years based on their school records. All the subjects were day scholars attending the school from 8.45 a.m to 3.45 p.m. The schools considered for these students were under the control of The Director of School Education, Government of Puducherry. In order to ensure full cooperation from the subjects, the scholar had a brief meeting with the respective heads of institutions and the physical education teachers. The requirements for the study were explained to all the subjects in the presence of their physical education teachers and all the subjects voluntarily agreed to undergo the prescribed tests. Physically handicapped boys were not included as subjects.

Rural Schools

4. Government Middle School, Karukkankudi, Karaikal.
5. Government Middle School, Surakudi, Karaikal.
9. Government Middle School, Farampetta, Yanam
10. Govt. High School, Kanakalpetta, Yanam

**Urban Schools**

2. Government Middle School, Pakkamudayanpet, Puducherry.
3. Government Middle School, Kothukulam, Karaikal.
4. A.S. Pakkirisamy Government Middle School, Karaikalmedu, Karaikal.
5. Government Lower Primary School, Pandakkal, Mahe.
7. Government Middle School, Kanakalapeta, Yanam.
8. Mahatma Gandhi Government Boys High School, Yanam
9. Indira Gandhi Government English Medium High School, Yanam

**SELECTION OF VARIABLES AND TESTS**

The research scholar reviewed the available scientific literature pertaining to motor fitness and socioeconomic status from various books and journals, periodicals, magazines, seminars and also discussions with experts, feasibility of criteria, availability of instruments, equipments and relevance of the variables were selected.
**TABLE - I**  
Selection of variables and tests

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Motor Fitness Variables</th>
<th>Test Items</th>
<th>Units of Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>To measure cardiovascular endurance</td>
<td>9 min. run / walk</td>
<td>In meters</td>
</tr>
<tr>
<td>2.</td>
<td>To measure abdominal strength and endurance</td>
<td>Bent Knee Sit-Ups</td>
<td>Number of sit-ups in 60 seconds</td>
</tr>
<tr>
<td>3.</td>
<td>To measure arm strength</td>
<td>Push-ups</td>
<td>Number of push-ups in 60 seconds</td>
</tr>
<tr>
<td>4.</td>
<td>To measure explosive power of leg extensors</td>
<td>Standing broad jump</td>
<td>In meters</td>
</tr>
<tr>
<td>5.</td>
<td>To measure speed.</td>
<td>50 yard dash</td>
<td>In seconds</td>
</tr>
<tr>
<td>6.</td>
<td>To measure agility</td>
<td>Shuttle run</td>
<td>In seconds</td>
</tr>
<tr>
<td>7.</td>
<td>To measure arm and shoulder Girdle coordination</td>
<td>Cricket ball throw for distance</td>
<td>In meters</td>
</tr>
<tr>
<td>8.</td>
<td>To measure flexibility</td>
<td>Modified sit and reach test</td>
<td>In centimeters</td>
</tr>
<tr>
<td>9.</td>
<td>To measure balance</td>
<td>Stroke stand (Static balance)</td>
<td>In seconds</td>
</tr>
<tr>
<td>10.</td>
<td>S.D. Kapoor and H.C. Kocher’s SES Questionnaire used.</td>
<td>Socio-economic status (SES)</td>
<td>Questionnaire</td>
</tr>
</tbody>
</table>
PILOT STUDY

To know the practical difficulties in the administration of tests for school boys, the investigator conducted a pilot study for 20 boys in the Government Middle School, Pakkamudayanpet, Oulgaret Commune, Pondicherry. Based on the experiences of the pilot study, individual score sheet system consisting a pair of boys per score sheet was introduced to record all the test results as well as individual particulars. This system minimized the time of recording. Also it created a sense of competition.

RELIABILITY OF DATA

The reliability of data was ensured by establishing the instrument reliability, tester reliability and the subject’s reliability.

INSTRUMENT RELIABILITY

Japan made stop watches calibrated to 1/100th of a second and standard types were used since the reliability of instruments used were ensured by their manufactures, they were adequately reliable and valid for this study.

TESTER’S RELIABILITY

To ensure uniformity, reliability of the testing techniques and to test the competency of the testers, all the measurements were taken by the investigator.

RELIABILITY CO-EFFICIENT OF CORRELATION OF TEST AND RE-TEST SCORES

Reliability was established by the test and retest method was administrated by the same tester to ensure consistency of result which was obtained in each test item was correlated by Pearson’s product movement correlation. The correlation co-efficient obtained between the test and retest data were significant at 0.05 level of confidence as shown in table-II.
Table: II

Reliability co-efficient of Correlation of Test - Retest Scores

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Test items</th>
<th>No. of subjects</th>
<th>Co-efficient of correlation ‘r’</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cricket ball throw</td>
<td>20</td>
<td>0.98*</td>
</tr>
<tr>
<td>2</td>
<td>Bent knee sit-ups</td>
<td>20</td>
<td>0.88*</td>
</tr>
<tr>
<td>3</td>
<td>Push-ups</td>
<td>20</td>
<td>0.96*</td>
</tr>
<tr>
<td>4</td>
<td>Standing broad jump</td>
<td>20</td>
<td>0.97*</td>
</tr>
<tr>
<td>5</td>
<td>Modified sit and reach</td>
<td>20</td>
<td>0.96*</td>
</tr>
<tr>
<td>6</td>
<td>Stroke stand</td>
<td>20</td>
<td>0.93*</td>
</tr>
<tr>
<td>7</td>
<td>50 yard dash</td>
<td>20</td>
<td>0.93*</td>
</tr>
<tr>
<td>8</td>
<td>Shuttle run</td>
<td>20</td>
<td>0.93*</td>
</tr>
<tr>
<td>9</td>
<td>9 min run/walk</td>
<td>20</td>
<td>0.86*</td>
</tr>
</tbody>
</table>

*Significant 0.01 and 0.05 level

SUBJECT RELIABILITY

The test retest correlation co-efficient will also indicate subject reliability as the same subject will be used under similar conditions by the same tester.

ORIENTATION OF THE SUBJECTS

The subjects were asked to assemble in a classroom where, the researcher explained them the nature and purpose of the study, the questionnaire designed and the details to be filled in. In order to get full co-operation from the subjects, the investigator will explain about the purpose of the study. He will also explain the tests and variable and then demonstrate the tests. Model performance by some subjects will be done to make the subjects clearly understand the tests.
CRICKET BALL THROW FOR DISTANCE  
(In Meters)

Purpose
To measure arm and shoulder girdle co-ordination

Equipment
Cricket balls, measuring tape metal stakes and lime powder

Procedure
A football field marked in conventional fashion (5 meters interval) was made for this test. Two parallel lines 6 feet apart are placed in the throwing area as restraining lines. The throw must be made from within the area. The students using over head throw, throws the ball straight down the throwing area. Three trials are permitted and taken in succession. Only the best throw is recorded.

Scoring
The best distance of the three trials is measured in meters.

BENT KNEE SIT-UPS  
(One minute)

Purpose
To assess the muscular endurance.

Equipment
Smooth surface, stop watch, a whistle and score sheets.

Procedure
The straight knee sit-ups were administered to determine the subject’s muscular endurance. The subjects were paired to assess in
scoring and to hold the partners feet above the ankles. The subject took the spine position with feet together, hands clasped behind the neck and elbows squarely on the floor. The feet were held firmly his partner. From this position the subject raised his head and upper extremity flexing simultaneously forward and his knee with his elbow. The subject returned to this spine position each time he touched his knee alternately with his elbow.

**Scoring**

The total number of correctly executed sit ups performed in (one min) 60 seconds was recorded.

**PUSH-UPS**

*(In one minute)*

**Purpose**

To measure the endurance of the arm and shoulder strength.

**Equipments**

A mat on the floor and score sheets.

**Procedure**

The subject asked to lie down on the mat (floor). With the knees bent at right angles and the hands on the floor (directly under the shoulders), the performer lowers his body to the floor until the chest touches, and then he/she pushes back to the starting position. The exercise is continued for as many repetitions as possible without rest. The body must not sag but maintain a straight line throughout the trial.

**Scoring**

The score is the number of correct push-ups executed.
STANDING BROAD JUMP
(In meters)

Purpose

The purpose of this test is to measure the explosive power of leg extensor muscles.

Equipment

Measuring tape, lime powder and score sheets.

Procedure

The subject assumed a comfortable position just behind the take off line, with feet slightly apart. He was permitted to crouch and swing his arms to aid the jump. On command, “go” he jumps into the pit. He should take off with both the feet simultaneously. Three trails were given. It was considered as foul if he a) Falls back b) Walks back c) Takes of crossing the take off line.

Scoring

The best distance of the three trials from the take off line to the nearest break, with any part of his body, was measured in meters.

SIT AND REACH TEST
(Flexibility in Centimeters)

Purpose

To measure the development of hip and back flexion as well as extension of the hamstring muscles of the legs. The object is to see how far you can extend your finger tips beyond your foot line with the legs straight.

Equipment

Flexomeasure case with yard stick and tape.

Procedure

(1)Line up the 15-inch mark of the yardstick with a line on the floor and tape the ends of the stick to the floor so that the flexomeasure
case (window side) is face down. (2) Sit down and line up your heels with the near edge of the 15-inch mark and slide your seat back beyond the zero end of the yardstick. (3) Have a partner stand and brace his toes against your heels. Also, have an assistant on each side to hold your knees in a locked position as you prepare to stretch. (4) With heels not more than 5 inches apart, slowly stretch forward, while pushing the flexomeasure case as far down the stick as possible with the finger tips of both hands. Take your reading at the near edge of the flexomeasure case.

**Scoring**

The best of three trials measured to the nearest quarter of an inch is your test score.

**STATIC BALANCE TESTS**

*(Balance in Seconds)*

**Purpose**

To measure the static balance of the performer while supported on the ball of the foot of the dominant leg.

**Equipment**

Stop watch or wrist watch.

**Procedure**

From a stand on the foot of the dominant leg place the other foot on the inside of the supporting knee and place the hands on the hips. Upon a given signal, raise the heels from the floor and maintain the balance as long as possible without moving the ball of the foot from its initial position or letting the heel touch the floor.

**Scoring**

The score is the greater number of seconds counted between the time and heel is raised and the balance is lost on three trials with the preferred foot only, the highest score is recorded.
**50 YARD DASH**

**(In Seconds)**

**Purpose**

The purpose of the 50 yard dash test was to measure the maximum speed.

**Equipment**

Measuring tape, stop watch, lime powder, whistle and score sheet.

**Procedure**

Fifty yard dash test was administered to determine the subjects speed. A starting line and a finishing line with 50 yard apart was marked two lanes of 1.22 meters width were also marked from the starting line up to the finishing line. Subjects in pairs ran simultaneously, subjects were asked to stand behind the starting line. The investigator used the command “on your marks”, “set”, and blew the whistle. At the sound of the whistle the subjects ran their maximum speed. At the same time the sound of the whistle was accompanied by a download sweep of the investigators arm, as a signal to the time keeper. The stop watches were used by two time keepers.

**Scoring**

The time elapsed from the start to finish was recorded in seconds and rounded off to the minimum of a second.

**SHUTTLE RUN**

**(In Seconds)**

**Purpose**

The purpose of this test was to measure speed and change of direction (agility).

**Equipment**

Two blocks of wood 2 inches x 2 inches x 4 inches, stop watch, score sheet, measuring tape and chunnam powder.
**Procedure**

Two parallel lines were drawn on a floor 10 meters apart. The blocks were placed behind the line other than the starting line. The subject stood behind the starting line. At the sound whistle of the subjects ran towards the block and at the same time the stopwatch was started. The subjects picked one of the blocks and returned to the starting line (with maximum speed) and placed the block behind the line the subject followed the same method and picked the second block there by covering a distance of 6x10 meters. Two trails were given.

**Scoring**

The better of the two trails were recorded of a second.

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**9 MINUTES RUN AND WALK**

*(In Meters)*

**Purpose**

To assess the cardio-vascular endurance.

**Equipment**

Stop watch, measuring tape, score sheet and whistle.

**Procedure**

Prior to the administration of the nine minute run/walk test, the 400 meters track was marked with a distance of 100 meters each and for every 10 meters a distinct line was marked.

The subjects were grouped in pairs. So when one group was running the designated partners from the group acted as lap scores. The subject’s were asked to run /walk for nine minutes. At the ninth minute the whistle was blown. The subject’s stopped at the spot the sport till the measurement was recorded. The test which 9 minutes run/walk for boys were administered.

**Scoring**

The distance covered by the subject for nine minutes was recorded in nearest meters.
SOCIO-ECONOMIC STATUS
(Questionnaire)

In order to assess the socio-economic status of the subjects S.D.Kapoor and H.C.Kocher socio-economic status questionnaire was used. It is a self-administering questionnaire which can be used for adult as well as students. Each question has many possible answers. But the subject was supposed to mark against one specific answer only. On the whole, the questionnaire has twelve (12) items which may concern with both rural and urban population, scoring of the answer sheet had been done, according to the instruction made in the manual.

ADMINISTERING THE QUESTIONNAIRE

As mentioned above the subjects were asked to assemble in a classroom and the researcher distributed the questionnaire, in English. The inventory is self-administering. To ensure careful reaching of the instructions, the examiner reads the same while pupils being tested listen to researcher and read the same silently. There is no time limit, but normally it takes 30 minutes for the pupil to answer all the questions in the questionnaire. Each person being tested should interpret the questions himself. However, any doubt regarding the meaning of questions and terms may be clarified with the researcher. The researcher should make every effort to secure complete co-operation of all individual’s answering the question. If questions concerning the purpose and use of the test arise, they should be answered frankly and honestly. After the pupil answers the questionnaire before collecting the questionnaire back, it is well to remind the students to write their names and signature.
ASSESSMENT OF SOCIO-ECONOMIC STATUS

The data regarding Socio-Economic Status of the pupil is also collected and the following measure was taken for the same.

1) The designed questionnaire consisted of places designed to fill up the various details.

2) A separate column is designed to fill in the educational qualification of the parents which is basically categorized into eight groups, which are illiterately, primary education, secondary education, graduate, post graduate etc..

3) A separate column is designed to fill in the house hold annual income from all sources of the family. The family income is basically categorized into two groups below Rs. 2000/- and Rs. 15,000/- and above.

METHOD OF SCORING

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Details</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>What kind of occupation / profession you are engaged in?</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a High administrative (gazetted officer), Managerial or business:</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>High professionals (big Lawyer, Doctor, University professor)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b Average administrative (Non-gazetted officer):</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Business and technical jobs, professional such an average Lawyer,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doctor, College Teacher, Merchants.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c Clerk or Trader: Ordinary business or technical work or other skilled</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>jobs: Middle or Primary school teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d Semi - skilled jobs: Agricultural job: Artisan or class IV employee</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>in Govt. service.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e Unskilled labourer any other manual work</td>
<td>2</td>
</tr>
</tbody>
</table>
2 What is your highest education?
   a Research or Doctorate Degree 8
   b Post Graduate Degree 6
   c Graduate Degree 4
   d Intermediate. 3
   e Higher secondary / matriculation, etc. 2
   f Middle school education 1
   g Primary school or literate level. 0
   h Illiterate or no education. 0

3 What is your average monthly income?
   a More than Rs. 15,000 12
   b Between Rs. 12001 – 15000 10
   c Between Rs. 8001 – 12000 8
   d Between Rs. 5001 – 8000 6
   f Between Rs. 2001 – 4000 4
   e Between Rs. 2000 or less 2

4 What type of house you live in?
   a A big bungalow with lawn, electricity, telephone or a mansion. 4
   b A big bungalow or pucca house with a lawn and electricity. 3
   c A pucca house with electricity. 2
   d A big katcha house or a katcha house or a katcha pacca mixed one 1
   e A small katcha house 0

5 Please check all these material of your house, from the following list, in the appropriate boxes given against each of them.
   Car 5
   Motorcycle or scooter 4
   Computer 3
   Rickshaw 2
   Cycle 1
Sofa-set 3
Decent table chair 2
Wooden chair 1

Transistor 2
Radio 1

Wall clock 3
Time piece 2
Wrist watch 1

Refrigerator 3
Shelf 2
Almirah 1

Electric-stove 3
Electric fan 2
Stove 1

6. **How much amount your family spend a month on magazines/books etc.?**
   a. More than hundred rupees per month approximately. 4
   b. Between 61 to 100 rupees per month approximately. 3
   c. Within 41 to 60 rupees per month approximately. 2
   d. Within 21 to 40 rupees per month approximately 1

7. **Does a newspaper come to your house regularly?**
   a. Yes. 2
   b. Sometimes 1
   c. Never 0
8. **What is the highest education your sons / obtained / is obtaining?**
   
a. Post graduate or above  
   b. Up to graduate  
   c. Intermediate  
   d. Matriculation or higher secondary

9. **What is the highest education your daughters / has obtained / is obtaining?**
   
a. Graduate or above  
   b. Intermediate  
   c. Matriculation or higher secondary

10. **What kind of occupation do you like to settle your economic life or what is the most desirable profession you had planned / would plan?**
    
a. Engineer, Doctor, Professor, Executive jobs  
   b. Social worker, Artist, Trader  
   c. Mechanic, Clerk, Accountant, Salesman, Teacher

11. **Which of the following should determine a person’s social prestige?**
    
a. His occupation / Profession / Job  
   b. His economic status, property etc  
   c. His caste

12. **Do you believe that the caste-system is useful for the society?**
    
a. No.  
   b. Uncertain  
   c. Yes.
STATISTICAL TECHNIQUES EMPLOYED

To compare the motor fitness and socio-economic status between rural and urban school boys of the Union Territory of Pondicherry, namely Puducherry, Karaikal, Mahe and Yanam, the scores for each test items and socio-economic status (SES) were gathered for all the subjects and then pooled region wise, in order to examine the significance difference among the performance made by the subjects belonging to the four regions involved in this study on different items of motor fitness variables and socio-economic status. Analysis of variance (ANOVA) was applied in order to find out significance of differences among the regions of the Union Territory of Pondicherry on different items for the above said variables. The obtained “F” ratio was found significance differences among the regions Scheffe’s post-hoc test was applied to study the significance of differences between the paired means.

Further, to find out the motor fitness variables and socio-economic status between rural and urban school boys of the Union Territory of Pondicherry, “t” test was applied.

In addition to find out the influence of socio-economic status (SES) on selected motor fitness variables, the two way factorial design (2 x 3) Analysis of variance (ANOVA) was also used.

The “F” ratio for rows test the significant differences if any, among rural and urban irrespective of socio-economic status such as upper, middle and lower in each dependent variable. The “F” ratio for coloumns analyses the significant difference, if any among socio-economic status (upper, middle, lower) irrespective of rural and urban in each dependent variables separately.
The “F” ratio for interaction compares the means of the performance of the rural and urban in different socio-economic status such as upper, middle and lower on the selected motor fitness variables.

If the “F” ratio obtained for interaction was significant, then the simple effect test was used to find out which of the means performance scores for area and socio-economic status were significant.