CHAPTER - III

METHODOLOGY

By considering the involvement of a numerous quantifications, investigation requires the collection and interpretation of a mass numerical data. In order to ascertain, proper phases have been acquired for arriving at a conclusive Physical Fitness Test for Boys of Higher Secondary Level of Assam State.

In this chapter, the selection of subjects, selection of tests, reliability of data, collection of data, test administration and statistical techniques for analysing data have been described.

Selection of Subjects

The purpose of the study is to Develop Physical Fitness Test for Boys of Higher Secondary Levels of Assam State. A list of all the Higher Secondary Schools (State administered, Public School, Aided School, etc.)
of Assam State was procured from the Higher Secondary Education Council, Ambari, Guwahati, Assam. The state of Assam is divided by the mighty Brahmaputra river into two valley, viz. North valley and South valley, and also geographically divided into two part, viz. Upper Assam and Lower Assam. Hence the state of Assam have been zoned into four, viz. Upper South Assam, Upper North Assam, Lower South Assam and Lower North Assam.

Since this state has a diverse characteristics in regard to location, community, socio-economic structure. In order to give the representation to all segments of the society it has been efforts of the researcher to accommodate all the section of society in the present study. The selection of the subject was done randomly.

Out of the total number of schools in each zone of Assam, four schools, each were selected at random to have true representative of the population.

The Principal and the Sports and Games Teacher Incharge of the selected schools were contacted and proposed, and the purpose of the study was explained to them. All of them readily agreed to extend full
cooperation and assured fullest possible cooperation in this regard.

From the records of the students enrolled in classes XI - XII of the selected schools, those students who were 16, 17, and 18 years of age were separated. Out of these students 5 subjects were selected randomly from each group. Thus, a total of 15 subjects were selected from each school and 240 subject were selected in total from all the selected schools. Hence, each age group as considered in this study had 80 boys as subjects. The selection of these age groups of 16, 17 and 18 years was based on study of reported literature and through consultation with experts.

Selection of Test Items

Many tests of physical fitness are available, such as AAHPER Youth Fitness Test, Glover Physical Fitness Test, North Caroline Motor Fitness Battery, California Physical Performance Tests, NSWA (NAGWS) Physical Performance Test, Kirchner Physical Fitness Test, etc.,
considering these standard tests. Twelve test items, predicted to measure different components of physical fitness of higher secondary level boys were selected from a broad component of test items was done by the researcher through consulting the experts, study of reported literature, consideration of appropriate component of physical fitness in Indian situation, and also researcher’s own experience in the field. The criterion used while selecting the different test variables was the face validity of the respective test.

The selected test items were:

1. Pull-ups
2. Sit-ups
3. Vertical Jump
4. Standing Broad Jump
5. 50 Meter Dash
6. 60 Meter Dash
7. Shuttle Run (4 x 10 Meters)
8. Squat Thrust
9. Sit and Reach Test
10. Bridge up Test
11. 9 Minutes Run and Walk
12. 12 Minutes Run and Walk

Objectivity and Reliability of Test Items

Objectivity and Reliability of the 12 selected test variables were obtained on a small samples (ranging from 15 to 20 numbers) of students from two different Higher Secondary Schools were considered for the administration of tests. Boys were given sufficient time to practice and to familiarized themself with the test. Three to four trials of tests were given, depending upon the intensity of the test. The tests demanding cardio-respiratory endurance, only one trials was taken.

Objectivity of the tests was obtained by administering the test by two testers on the same sample, same day and at two different sessions. Sufficient rest was given between the two sessions.

Reliability of the test items was obtained by the test-retest method. The tests were administered by a
tester on two different days and on the same sample. For tests which require minimum physical efforts were readministered the same day.

**Collection of Data**

The selected 12 test items were administered to boys of Higher Secondary Level of Assam. The month of October 1995, was selected for data collection, because most of the sports and games would be completed and the students would be free, and anticipated that free from sports competition and examination will make them more enthusiastic. On the day of data collection a great number of students were available on both session of the consecutive days of the test administration.

In the first session of the first day, the students had been explained, the significance of the study and the need for active participation, by the researcher. The age and other required information was collected in the same session from the school records. Then the 12 test variable were equally distributed for the remaining
session, by considering various factors that affected the performance of the test items. Factors like muscular involvement, mode of administration, students limitation, degree of difficulty of a test, fatigue factor, etc., were considered to decide the order of the administration of test. Sufficient rest between the tests, between the trials and between the sessions was given.

Initially students were provided on oral explanation regarding the test followed by a demonstration by the tester. Boys were allowed to practice well before their active participation in the test. Only after the full acquaintance of students with the test; the test was administered. A specimen copy of the score sheet and data of 100 samples are provided in Annexure - A.

The data so collected was subjected to factor analysis and multiple regression analysis in IBM PC AT, Computer having SPSS package, at Computer Centre, Department of Psychology, Aligarh Muslim University, Aligarh.
Four test variable of the physical fitness separated the factor analysis findings, were administered to a sample of N-140 boys of higher secondary school of Assam (all the zones). Raw data of samples are provided in Annexure - B.

**Administration of Tests Items**

The selected test variables with predicted physical fitness component in respect of Higher Secondary School boys are given in the following pages along with details of test administration, instructions, scoring, etc. The familiar tests have been considered with some minor modifications, for example, standing broad jump-scoring was in meters, instead of inches; in vertical jump, coloured chalk powder was used instead of chalk and the students used the middle finger to mark on the wall. Likewise most of the selected tests were modified and used for this study; and such modifications are recorded accordingly. In order to be more precise, the researcher has acquainted well with the administration of these
selected test variables.

The selected test items were administered, six test variables in one session a day in each school giving sufficient rest between the tests. Proper measures had been taken to motivate the boys to perform their best on the test items.

Description of Test

Pull - Ups

Equipment:

A horizontal bar, Ladder were used.

Procedure:

The subjects were hanged from the bar with palms facing forwards (over hand grip), the body. Then he pulled himself straight up until his chin had crossed just over the bar and then let himself down until his arms fully extended to complete one cycle. The subjects were asked to continue the process until unable to pull himself up any more. The subject were given only one
chance to do, as repeating the items does reduces the performances.

**Scoring** :

Scoring is in number, one for the one correctly executed cycle.

**Sit-Ups**

**Equipment** :

Dari

**Procedure** :

The subjects were made to lie flat on their back with knees bent, feet on the floor having some one sits on their feet and hooking, heels no more than one feet from the buttocks. Hands folded behind their head with the elbows touching the floor. At the command "Start" they were asked to curls up to sitting position and go back to starting position. The moment was repeated for 60 seconds. At the end of the allotted time "Stop" the command was given. Only one chance was given to each subject.
Scoring:

Score is in number, one for each correct sit-ups. The maximum number of sit-ups correctly completed in 60 seconds.

**Vertical Jump**

Equipment:

Wall marked in centimeter, coloured chalk powder.

Procedure:

The subject were asked to stand by side of the marked wall and to extend one hand, the reach on the wall has been recorded. Then the subjects were asked to come to crouched position and then jump vertically up, to tap at the right vertical point of scale.

Scoring:

The one best difference of jump reach and standing reach of three trials have been recorded to the nearest centimetre.
**Standing Broad Jump**

**Equipment:**
Lavelled jumping pitch, chalk powder and measuring tap.

**Procedure:**
The subjects were asked to position himself behind the take-off mark with his feet parallel. Then have been asked to jump forward for a maximum horizontal distance, with preliminary swings of hip, knee and arm. The distance covered has been recorded.

**Scoring:**
The best/highest distance jumped of three trials measured have been recorded to the nearest centimeter.

**50 Metre Dash**

**Equipment:**
50 Metre straight lanes and stop watches.

**Procedure:**
The subjects were asked to get down to a crouch.
starting position on the command "on your mark", on the second command "Set", they were ready to run and at the command "Go", they dashed towards the finishing line marked at a distance of 50 meter, in the shortest possible time.

**Scoring :**

The best of the three trials was recorded to the nearest tenth of a second.

**60 Metre Dash**

**Equipment :**

60 Meter straight lanes and stop watches.

**Procedure :**

The subjects were asked to get down to a crouch starting position on the command "on your mark"; on the second command "Set", they were ready to run and at the command "Go", they dashed toward the finishing line marked at a distance of 60 meter, in the shortest possible time.


**Scoring**:

The best of the three trials was recorded to the nearest tenth of a second.

**Shuttle Run (4 x 10 Meters)**

**Equipment**: Wooden blocks, chalk powder and stop watches.

**Procedure**:

Two parallel lines of 10 meter apart were marked on the ground and the wooden blocks were placed behind the other end (turning line). The subjects were asked to run from the starting time on the command "Go". They dashed towards the block and picks up one and come towards the starting time, placing the block behind the starting line, goes back for the second block, picking-up the second block, dask back and crosses the starting line finishing the course.

**Scoring**:

The time recorded to the nearest tenth of a second.
**Squat Thrust**

**Equipment:**

Stop watch.

**Procedure:**

The subjects were made to start from the standing position. On the command "Start", the subjects were to lower the body to a full squat rest position, leaning forward and placing the hands on the floor in front of the feet. Thrusts the legs backward to the front leaning rest position and then returns back to the squat rest position, and then to the standing position. This cycle of movement was counted as one. The subject repeats the cycle of movement faster they could until the command "Stop".

**Scoring:**

The number of cycle completed in 10 second.

**Sit and Reach Test**

**Equipment:**

Wooden box and Yard stick.
**Procedure** :

The subjects were made to sit in long sitting position on the floor with knees fully extended and soles of feet against wooden box. Then they were asked to bend forward stretching hands forward without flexing their knees. The maximum reached by the fingertip on the yardstick placed on the wooden box, edge adjusted to zero, had been recorded.

**Scoring** :

The distance recorded to the nearest centimetre.

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**Bridge-Up Test**

**Equipment** :

Yard stick, ruler and measuring tap.

**Procedure** :

The subjects were made to lie on supine lying position and then to push upward, arching his back higher, walking in hands and feet as close together as possible. The zero end of the yard stick was adjusted to
floor and then ruler had been slid vertically upward along the yard stick touching the highest point of the arch.

**Scoring**:

The best of the three trials nearest to the quarter of an inch was recorded.

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**9 Minute Run / Walks**

**Equipment**:

Running track, stop watches and whistle.

**Procedure**:

The subjects were asked to run on the command "Go", as many laps as possible around the course within 9 minutes. After every minute the time was shouted and at the end of the course of time, the whistle stopped the subject.

**Scoring**:

The total distance covered in meter was recorded.
12 Minute Run / Walks

Equipment:

Running track, stop watches and whistle.

Procedure:

The subjects were asked to run, on the command "Go", as many laps as possible around the course within 12 minutes. After every minute the time was shouted and at the end of the course of time, the whistle stopped the subject.

Scoring:

The total distance covered in meter was recorded.

**STATISTICAL TECHNIQUES**

Advanced statistical techniques such as factor analysis and multiple regression analysis have been used in this study to decipher the behaviour of numerical data concerning attributes of Physical Fitness.

The results have been obtained through the statistical package for Social Sciences (SPSS). Pearson
Product Moment formula has been utilized for correlation of variables. Correlations matrix was obtained, then Principal Components Analysis method was used to extract factors. Varimax Rotation (Kaiser's Normalization) was used to get rotated factor matrix. Multiple regression results were obtained through step method as provided in SPSS package.

Considering rotated factor loadings, communality, significant T-values, a Physical Fitness Test Battery of 4 test items was developed.