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METHODOLOGY

The present study was undertaken with a view to investigate the relationship among variables for the purpose of explaining a current state and predicting future occurrences.

In a scientific inquiry, after defining the problem and formulation of the hypothesis on the basis of literature, the next legitimate sequential order the researcher could follow is “data collection”. The detailed methodology of research design and data collection has been presented in this chapter.

III.01 – Research Design

The accuracy in results and quality of research findings depend mainly upon the research design. Research methodologists like Edwards (1968), winner (1971), Kerlinger (1978) and many others considered research design as a controlled mechanism ruled by the principle of “Max con Min”. The ‘Max’ explains the investigator to go for maximization of systematic variance’, whereas the ‘con’ explains to exercise the control over unwanted variable and ‘min’ give an understanding to minimize error variables so as to ensure disciplined data that contribute to a sound generalizations. While verifying research hypothesis a property designed research tells what to do and what not and indicate the steps to be taken in sequential manner for collecting the empirical data.

Selecting a proper research design and justifying its relevance, the present research further moved for its implication with a view to testing the hypothesis.
Present investigation is a relational study that considers the principles of basic research. The relationship of Performance Components and Performance Prerequisite Components with socioeconomic and its impact status has been established.

III.02 – The subject, Sample and Population

It has been stated earlier that 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 populations, has become a target in this scientific enquiry.

The major task in a sampling is to select a sample from the defined population by an appropriate technique that ensures that sample is representative of the population and as far as possible not based in any way. Sample must be adequately 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 techniques has been employed and the sample size has been targeted in this investigation only regular students of University intercollegiate competition of volleyball and basketball sports having ages between 18 to 25 years are the subjects of this investigation.

All three hundred and nine intercollegiate volleyball and basketball students of Dr. BAM University are selected samples for this study.
III.03 – Sources of Data

The data were collected on 309 subjects by administering the selected Performance Components and Performance Prerequisite Components tests, Socioeconomic Status Inventory.

According to the weekly timetable of the sample colleges, the schedule of data collection was planned in such a way so that it did not disturb the day to day routine work of the college. For smooth data collection, the investigator has checked out either the evening sports practice session or morning physical education and fitness program session for two days in a week for each college. Thus, the researches could cover two colleges in one week for complete data collection. Considering this schedule of data collection the investigator preplanned a 14 week schedule for the total 28 sample colleges. Data collection was started from March 2013 to March 2014 after getting permission from the principals’ form each of the selected colleges.

However, the schedules of the data collection have been presented below:

- A date-wise planning for data collection and testing-berth was prepared for each college separately and issued to college authorities well in advance so that selected subject could participate in all events of the testing programme.
- A day out date wise planning with time and testing berths was prepared for each colleges and issued to college authorities and selected subjects a week before, it helps to participate all subjects in the testing programme.
- The day-wise programme for data collection was mostly same for every college. Prior to the date of actual data collection, the
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Subjects were informed to come with proper dress for exercise and they must bring a pen or pencil for paper-pencil test.

- In the next morning 7:15 a.m. the subjects were assembled, where proper introduction about testing programs was given with a view to get systematic cooperation maximally from the subjects during data collections.
- From 7.30 a.m. to 8.30 a.m. the subjects were instructed to go for paper-pencil test, where the selected questionnaire was administered.
- After completion of paper-pencil test, the subjects were directed to approach the technical assistants for participating in each field events of Performance Components and Performance Prerequisite Components. This also includes other associated test viz. height, body weight.

The timings in details have been presented in Table 3.1

Table 3.1

A Day-wise Data Collection schedule for each college

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Time</th>
<th>Event</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.15 a.m. to 7.30 a.m.</td>
<td>Assembly and instruction</td>
<td>All</td>
</tr>
<tr>
<td>2.</td>
<td>7.30 a.m. to 8.30 a.m.</td>
<td>SES Scale</td>
<td>All</td>
</tr>
<tr>
<td>3.</td>
<td>8.30 a.m. to 9.00 a.m.</td>
<td>Height, weight</td>
<td>All</td>
</tr>
<tr>
<td>4.</td>
<td>9.00 a.m. to 9.30 a.m.</td>
<td>Height, Weight</td>
<td>All</td>
</tr>
<tr>
<td>5.</td>
<td>9.30 a.m. to 10.00 a.m.</td>
<td>12 min Run &amp; Walk test</td>
<td>All</td>
</tr>
<tr>
<td>6.</td>
<td>10.15 a.m. to 10.45 a.m.</td>
<td>Sit and Reach Test - sit ups</td>
<td>All</td>
</tr>
<tr>
<td>7.</td>
<td>10.45 a.m. to 11.30 a.m.</td>
<td>Sit ups sit and Reach test</td>
<td>All</td>
</tr>
</tbody>
</table>

Group I

Group II
III.04 – Reliability of Data

III.04.1 – Subjects Reliability

The subject’s reliability was established by ‘test retest’ coefficient of correlation of the scores obtained from the Performance Components and Performance Prerequisite Components tests and the inventory impact of Socio-economic status.

The gap between the test and retest was minimum 15 days. However, retest was completed upon 20% of the total target sample. By employing Pearson’s product moment method, relationship between the scores of the first and second measurements of the subjects in each test was determined.

Test-retest reliability coefficient of sample on the items of the Performance Components and Performance Prerequisite Components tests viz., 12 min run-walk, sit ups, flexibility, body fat % were recorded as 0.78, 0.96, 0.92 and 0.93 respectively. However in the case of hand-grip the reliability coefficient was 0.84. The coefficient of subject’s reliability on impact of socioeconomic status and Birth order were recorded as 0.87, 0.93 and 1.00 respectively.

III.04.2 – Tester’s Reliability

Five specially trained physical education lectures and five M.Ed. (Physical Education) final year students assisted in collecting data on different items of Performance Components and Performance Prerequisite Components tests and papers pencil test.
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The assistants were 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 15 subjects in the specified test, on trial basis, for which test would be allowed to collect data.

The testers reliability co-efficient were determined statistically, which were ranged from 0.90 to 0.98. It is amazing to note that all the coefficients were found statically significant at the 0.01 level. Therefore the final measurements taken with the help of these assistants was considered reliable and fully justified.

III.05 – Variables Measured

Following variables have been delimited in this study for measurement and for establishing the inter-relationship:

- Morphological variables i.e., Body height and Body weight
- Performance Components and Performance Prerequisite Components i.e., cardio vascular endurance, body mass index, flexibility and abdominal muscle strength and endurance.
- Since the above referred Performance Components and Performance Prerequisite Components tests do not include strength and endurance aspect of upper limbs, the grip strength test has not been included in this study.
- Psycho-social variable i.e., impact of socio economic status.

III.06 – Criterion Measures and Tools used:

- Selected morphological variables, viz. Body weight was measured with the help of a weighing machine nearest to 0.5 kg., whereas
standing body height was measured nearest to 0.5 cm by using a vertical scale fixed with the wall.

**Performance Components tests variables were measured as follows:**

- Muscular strength was measured with the help of Push Ups.
- Muscular endurance of abdominal muscles was measured by using sit ups test and the score was recorded in number of sit ups performed in one minute.
- Flexibility was determined by administering Sit and Reach Box and the score was recorded nearest to 0.5 cm.
- Cardiovascular endurance was assessed with the help of field event i.e., 12 minutes run-walk and the scores were recorded nearest to 0.5 meter.
- Body Mass Index: It is the ration of weight (Kilograms) and Square of the height (Meters) thus BMI = Body Weight (Kg.) / Height (M)^2.

**Performance Prerequisite Components was measured as follows:**

- Speed, measured with the help of sprint Test (say 50 M Dash Test)
- Balance: It is the ability of body to maintain equilibrium under static and dynamic conditions. Bass Stick Test measures balancing ability of body.
- Agility was measured with the help of a Shuttle Run.
- Neuromuscular coordination. It is dependent on the coordinative process of nervous system & functional capacity of sense organs. Wall volley test measures.
III.07 – Description of Test

III.07.1 – Description of Performance Components tests:

Physical fitness test (AAHPER, 1984) was administered to measure the level of Physical fitness. As this is a correlation study, the researcher did not use the norms of the said AAHPER test. The researcher is also aware of the fact that although Pargaonkar (2003) has developed the norms of this test for school children, however the same for the college level population is not available till date. However to find out the applicability of the test-items on the present sample, the researcher determined the reliability. The co-efficient of reliability of the test item were ranged from 0.74 to 0.86 which were found statically significant.

This test comprises of four components, viz.

→ Cardiovascular Endurance
→ Body Composition
→ Flexibility
→ Abdominal muscle strength and endurance.

The above components were measured by the following test items:

- Although 1 mile run test has been suggested so far to measure one’s level of cardiovascular endurance, sample of recent reports support the utility and applicability of cooper’s 12 minutes run-walk. It was, therefore, included in this study.

- Body Mass Index is defined as the ratio of Weight in Kilograms and the square of the Height in Meters.

- Since flexibility has been accepted as one of the factors as include in this test, it leads to much confusion because here are different types of flexibility e.g., forward flexibility, backward flexibility, sideward flexibility, twisting flexibility, dynamic flexibility etc.
AAHPER test batter, in fact, has incorporated only one test of flexibility i.e. forward flexibility. Although it looks amazing that why AAHPER incorporated only forward flexibility, however, scientific literature support favorable relationship of back and hamstring muscles with one’s health. Therefore, inclusion of only forward flexibility as suggested by AAHPER seems to be justified.

- Although Electro Myography (EMG) instrument helps to measures accurately the functioning of muscles including the abdominal muscles, literature in physical education establishes an exercise “Bent Knee Sit Ups” if performed for one minute, can predict one’s functioning level of abdominal muscles. The leading organization “AAHPERD”, therefore, could incorporate “sit ups” event as one of the test-items.

However, the description of each of the above test-items of Physical fitness has been presented below:

A) TEST: DISTANCE RUNS

Purpose:

The purpose of the distance runs is to measure maximal functional capacity and endurance of cardio respiratory system.

Equipment:

Stop watch, scorecards, pencils, 400 Meter track or any other flat measured surface.

Procedure:

Run and walk for 12 minutes has been administered for this purpose. Instruct the student to run as fast as possible, beginning on the signal “Ready start”!
As the student crosses the finish line, call out the elapsed time, which should be recorded by the student or the student’s partners. Walking, although permissible, should be discouraged since the purpose of the test is to measure maximal capacity.

**Scoring:**

The performance in distance covered by the subjects within 12 minutes is scored to the nearest 0.5 meters.

**B) TEST : BODY MASS INDEX:**

**Body Height**

**Purpose:**

To measure the standing body height of the subjects

**Facilities and equipments**

Man power (one helper and one scorer), wall perpendicular to a flat surface, Measuring tape and scale.

**Procedure:**

Each subject, one by one, stands on the flat surface adjacent to the perpendicular wall where the measuring tape was been fixed. Subject stands bare footed in front of the wall (fixed with scale) contacting his heels, buttocks, and upper back and back of the head making firm contact with the scale. A foot scale was placed on the subject’s head that firms right angles with the measuring wall tape. Keeping the scale at its position, the subject was instructed to come out of the wall and the score of height of each subject was recorded.
Score: The score was recorded in cm least count to 0.1 cm.

Body Weight

Purpose:
To measure the body weight of subjects

Facilities and Equipments:
Manpower (one helper and one scores), weighing Machine (Portable)

Procedure:
Each subject, one by one, stands on the flat surface of the weighting machine, which was kept on a hard surface. Subjects were not allowed shoes and chapples while standing on the machine. They were then instructed to stand erect by keeping equal weight on both legs and by looking towards front direction. They were restricted to move body while standing on the machine. Keeping the machine at its position the investigator took the reading from the pointer associated with a scale indicating body weight.

Score: The score was recorded in Kilograms.

BMI Procedure:
The Height in Meters and Weight in Kilograms is measured to the nearest value and the ratio is calculated through BMI equals to Body Weight in Kilograms divided by Height in Meter Square
C) TEST: MODIFIED SIT UPS

Purpose:
The modified sit ups test is used to measure abdominal strength and endurance.

Equipment:
Mats are recommended for safety comfort, stop watch and 6X6 square feet area with sufficient floor space may be used.

Procedure:
The starting position of the test is a back-lying position with knees flexed, feet on floor, and heels between 12 to 18 inches from the buttocks. The arms are crossed on the chest with the hands on opposite shoulders. A partner holds the examinee’s feet to keep them in contact with the testing surface. The examinee curls to a sitting position, maintaining arm contact with the chest. The chin should be tucked on the chest and should remain.

Scoring
The score is the numbers of sit-ups executed includes failure to curl up, pulling the arms away from the chest, failure to touch the things with the elbows and failure to touch the mid back to the testing surface in the down position.
III.07.2: Description of Body Height, Body Weight

A) BODY HEIGHT

Purpose:
To measure the standing body height of the subjects

Facilities and equipments
Man power (one helper and one scorer), wall perpendicular to a flat surface, Measuring tape and scale.

Procedure:
Each subject, one by one, stands on the flat surface adjacent to the perpendicular wall where the measuring tape was been fixed. Subject stands bare footed in front of the wall (fixed with scale) contacting his heels, buttocks, and upper back and back of the head making firm contact with the scale. A foot scale was placed on the subject’s head that firms right angles with the measuring wall tape. Keeping the scale at its position, the subject was instructed to come out of the wall and the score of height of each subject was recorded.

Score:
The score was recorded in cm least count to 0.1 cm.

B) BODY WEIGHT

Purpose:
To measure the body weight of subjects
Facilities and Equipments:

Manpower (one helper and one scores), weighing Machine (Portable)

Procedure:

Each subject, one by one, stands on the flat surface of the weighing machine, which was kept on a hard surface. Subjects were not allowed shoes and chapples while standing on the machine. They were then instructed to stand erect by keeping equal weight on both legs and by looking towards front direction. They were restricted to move body while standing on the machine. Keeping the machine at its position the investigator took the reading from the pointer associated with a scale indicating body weight.

Score:

The score was recorded in Kilograms.

III.07.3 – Description of Performance Prerequisite Components, speed, Balance, Agility and Neuromuscular coordination

A) SPEED

Purpose:

The purpose of the test is to measure speed.

Equipments

Area of desired length preferably on an athletic track, playground or football fields with a marked starting line a finish line two stopwatches.
Procedure:

The tester should give in advance, instructions to a group of 10-15 subjects as follows “you are required to take any position behind the starting line, wait for the starting signal on receiving the command ‘Go’! You are to start running as fast as possible till you reach the finish line. You are to slow down gradually only after crossing the finish line. Warm up just before the sprint test”.

After the warm up, subjects preferably in pairs are asked to take the starting position behind the starting line and to wait for the signal ‘GO’! A separate helper with a stopwatch is required to watch each subject at the finish line. The tester gives command ready, steady, ‘GO’! So that these are audible easily to subjects at the start line and the timers at the finish line. At the commands ‘GO’! The timers start their respective stopwatches and the subjects start their sprints. As soon as the subject crosses the finish line, the respective timer switches of his/her stopwatch and records the time accurate up to 0.01 second. Only one correct trial is permitted. The subject is asked to restart the sprint in case he/she starts before the word “GO”.

Scoring

The time elapsed form the start to the instant, subject crosses the finish line, is the score expressed usually up to hundredth of a second.

Score:

The score was recorded in cm least count to 0.1 cm.
B) BALANCE:

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

AGE LEVEL: Ages ten through college.

SEX: Satisfactory for both boys and girls.

RELIABILITY: An ‘r’ of 0.87 was found for this test when the best trial of the initial test was corrected with the best trial of the second test, which was administered on different days.

OBJECTIVITY: Reported as high as 0.99 as determined by Jim Knox, 1969.

VALIDITY: Face validity was accepted for this text.

EQUIPMENT AND MATERIALS: One stopwatch or a wrist watches with a second hand.

DIRECTIONS: 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 heel 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 greatest number of seconds counted between the time the heel is raised and the balance is lost on three trials with the preferred foot. Only the highest score is recorded.

ADDITIONAL POINTERS: (a) Students may be tested in pairs, with one performing while the other takes note of how long the performer balanced as the number of seconds are counted off (aloud) by the timer. (b) Students who failed to get started on time are retested. (c) The performer cannot remove this hands form his hips during the test.

C) AGILITY (SHUTTLE RUN TEST)

Purpose:
To measure the speed with which on individual may change his body positions or fastness in changing direction.

Equipments:
Two blocks of wood (2” X 2”X 4”) a stopwatch and marking powder

Procedure:
Two parallel lines are marked on the floor 10 meter apart or the width of the regular volleyball courts may be used for the test. The two wooden blocks are placed behind one of the line. The subject is asked to start from behind the other line. On the signal ‘ready”? Go, the timer starts the watch and the subject runs towards the blocks, picks-
up one block, runs back to the starting line, places the block behind the starting line, runs back and pick-up the second block to be carried back across the starting line. As soon as the second block is placed on the ground the timer stops the watch and records the time.

Score:

Two trials are allowed to each subject with some rest in between. The time of the better of the two trials is recorded to the nearest 10th of a second as the score of the test item.

D) Neuromuscular Coordination (Eye-Hand Co-ordination Test)

Purpose:

This test, as evident from its name, is used to test the co-ordination between eyes and hands.

Equipments:

Two large boxes or containers (capable of holding more than 5 balls of 10 inches diameters each) and a stopwatch

Test Administration:

The tester after giving a demonstration, asks a subject to stand in the middle of two boxes lying at a distance of 15 feet from each other. Five or more ordinary play ground balls of 10” diameter are put in the box lying on the left hand side of the subject. The tester gives the commands ‘ready’, ‘steady’, ‘GO’! At the word ‘GO’, the tester switches on the stopwatch while the subject runs to the box on his left, takes out one ball, run to the right box, puts the ball in the box, runs back to the left box to take another ball for putting in the right box and repeats the process till the last ball is put in the right box. As soon as the subject puts the last ball in the right box, the tester sops the
stopwatch to record the time taken by the subject to transfer all the five balls.

**Fig 3.1 Neuromuscular coordination Eye-hand coordination**

**Starting position**

| Left Box | 7.5' | 7.5' | Right Box |

**Scoring:**

The subject is given two trials after a slow practice trial. The best timing is the score of the test. The physical educators and coaches have tested however the testers depending upon the variety of ways the ball transfer skill have used a variety of scoring. For instance, different teachers have used different size and number of ball (tossing from a specified distance, toss it over a barrier, bounce it in the box, just simple placing). Accordingly, scoring has been correct number of balls transferred (during distance tossing), number of complete correct trials out of given number of trials or the time taken to perform the specified job.

**III.08 – Description of Socioeconomic Status (SES)**

For measuring Socio-Economic-Status (SES) of the urban population, numerous scales are available in literature. However, there exist many discrepancies in general in respect of assessing one’s family income. Hence, the present investigator decided to develop SES Scale in Marathi for urban population for using the
conceptualization of SES as spelled out by Hurlock (1964)\textsuperscript{03}, and Drever, (1964)\textsuperscript{04} and taking into account the revised economic status of the salaried as well as non-salaried individuals in Indian set up. The steps followed for developing this SES scale by Sonawane and Bera (2001) are described in brief as under:

a) The present scale of 'Socio-economic status' has been developed for literate people. At preliminary stage, areas of impact of socio-economic status were selected with the carefully on the basis of relevant literature and from some popular tests in the field. The list of the selected areas representing impact of ‘Socio-economic status’ and its impact was submitted to many of the eminent experts for knowing their agreements and disagreements pertaining to the inclusion of the area in the draft. Opinion of the experts pointed only five areas could provide desired information. Items in the form of questions or points for each area then prepared and were again submitted to experts to determine the hierarchy or ranking with reference to their importance of five selected areas. Considering the opinion of the experts the first form of the scale was then developed with the help of hierarchies as determined by the experts. This form of the inventory was administered on a sample of thirty adolescents; which indicated different difficulties in the process of administration, scoring etc. Removing these difficulties and adding instructions for easy administration, the draft form of the inventory was finalized. The major areas retained here were name, sex, education, college, age and birth order, where some psychosocial factors were also included.

b) Further to determine the reliability and validity of the SES inventory; a sample of 120 adolescents was tested with this SES inventory on two different occasions with an interval of one month.
The test retest reliability co-efficient of this inventory was found 0.94. For the sake of determining validity of this SES inventory, an external criterion in the form of close friend’s ratings was used. The obtained validity co-efficient, using external criterion, of this SES scale was found to be U-935 on a sample of 20 and their 20 close friends. Thus, it can be inferred that the SES scale in Marathi developed by Sonawane and Bera (2001)\textsuperscript{05} for urban dwellers is highly reliable and valid.

**Purpose of SES Scale**

To measure impact of socioeconomic status and to know the birth order of the subjects

**Facilities**

Manpower (two helpers), SES scale and answer sheets.

**Procedure**

SES scale sheets have been distributed with the help of helpers to the participated subjects. Instructions as printed on the top of the Questionnaire were explained to the subjects and instructed them to first enter his/ her demographic information and birth order and then give response to the SES scale. After completion of the full entry, the helper has collected the test sheets.

**Score**

The responses obtained on SES scale were scored keeping in view the following specification. For scoring the responses on item 'A' pertaining to educational status of family, i.e. of Parent of subjects, differential numerical weightage ranging from 1 to 9 were assigned to
the 9 degree of educational attainments from illiteracy to highest degree of university education.

For scoring item 'B' pertaining to occupational status of the family members, 3 numerical weightages ranging from 1 to 3 were assigned for the different occupational status such as low class (peon, helper, Gardner, labor, hikers likewise), middle class (teacher, clerk, medium businessman and likewise) higher class (manager, doctors, engineers, big businessman and likewise). To score income of the family i.e. 'C' item, numerical weightages ranging from 1 to 8 were assigned to the corresponding monthly income, the lowest being Rs.1200/- and below per month, and highest being Rs.1500/- and above per month. To score 'D' item regarding vehicle status four numerical weightages ranging from 0 to 3 were assigned. For no vehicle '0', for Bicycle '1', for two wheeler '2' and for '3' four wheeler weightage was assigned. For scoring "E" item, pertaining to communication means is telephone at home, two numerical weightages ranging as 0 and 1. Telephone facility is available then 1 and if ‘no’ then '0'. Following the above mentioned differential weightage system; the responses given by each subject on five-item SES scale in Marathi were considered.

III.09 – Checklist of equipment, Ground marking, Score sheets and test:

Sheets:

Based on the nature of variables of Physical fitness and psychosocial factors, the investigator collected the associated equipment / instruments. However, these equipments / instruments
were checked and their functional status has been verified accuracy in data status has been verified accuracy in data-collection. Checklist of the instruments has been presented in table 3.2

Table 3.2 - Checklist of the Instruments

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Item</th>
<th>Quantity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electronic Split Time watches</td>
<td>10</td>
<td>Functional</td>
</tr>
<tr>
<td>2.</td>
<td>Measuring Tape</td>
<td>02</td>
<td>Usable</td>
</tr>
<tr>
<td>3.</td>
<td>Whistles</td>
<td>06</td>
<td>Functional</td>
</tr>
<tr>
<td>4.</td>
<td>Pens</td>
<td>06</td>
<td>Usable</td>
</tr>
<tr>
<td>5.</td>
<td>Pencils</td>
<td>25</td>
<td>Usable</td>
</tr>
<tr>
<td>6.</td>
<td>Portable Weighting Machine</td>
<td>01</td>
<td>Usable</td>
</tr>
<tr>
<td>7.</td>
<td>Mats</td>
<td>02</td>
<td>Usable</td>
</tr>
</tbody>
</table>

In addition to this above, the concerned colleges were requested to spare a small classroom for assembly and for administrating paper pencils tests.

The investigator was able to form separate booth/station for measuring body height, weight, Body, fat % flexibility, sit up and 12 minutes run and walk. The availability of the requisite facilities for administrating the test as per the specific technical requirement was ensured before the schedule time. The investigator administered the 12 minutes run and walk test on a plane surface in the open field by accurate marketing of distance.

III.10 – Procedure of Test Administration:

The direction about the process of Test-administration, rules of participation in each test, time limit of performing each fitness factor and scoring principles were determined explicitly. Proper planning was
done well in advance and the helpers were exposed to different trials prior to actual test administration.

In order to get the best out of the subjects, permission from the principal and help from the physical education teacher of the respective schools were sought.

Since the investigator had to measure four components of physical fitness, body height and weight, of each subject of the sample of 309 cases, proper sequence in test administration was followed for smooth data collection.

The test-items were conducted strictly following the standard procedures described in the AAHPERD fitness-Test Manual and Psychological Test Manual respectively.

All the test items were administered. With the help of the professionally qualified personnel’s who were fully acquainted with testing procedures. The schedule of data collection has been presented earlier in this chapter (Table 3.1).

The subjects were explained the entire test items systematically prior to conducting the actual tests, in which they had to participate. They were also informed that performing these tests will in no way harm them in their academic achievement; rather it would help tem to know their own status of physical fitness.

Before the actual administration of the test the subjects were given an opportunity to participate in each of the test items, on trial
basis, if desired by the participants, so that they were well acquainted with the testing procedure.

**III.11 – Statistical Techniques used:**

Applying descriptive statistical the data have been processed primarily. Further, test-retest reliability and split-half reliability coefficients have been calculated whenever deemed necessary.

Before the actual administration of the test the subjects were given an opportunity to participate in each of the test items, on trial basis, if desired by the participants, so that they were well acquainted with the testing procedures.
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