CHAPTER - III

MATERIALS AND METHODS
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I. Collection of Data

The Samples:

For the convenience of the present investigation, 250 (Two hundred and fifty) boys reading in class VIII in the following 7 (seven) Schools, located at different districts of Manipur were selected randomly:

i) Koirangkhom Junior High School.

ii) Raja Dumbra Singh High School.

iii) Maibam Pali Junior High School.

iv) Heibong Makhong High School.

v) Irong Junior High School.

vi) Adim Jati High School.

vii) M.B.C. High School.
a) The Principals/Head masters and Physical education teachers (PETs) of the Schools extended their full co-operation during the course of the present investigation. Necessary particulars pertaining to age, address, attendance of the students in the Schools, etc., were collected from the School records. Parents/Guardians of the selected students were interviewed when required.

b) The dates of birth of the students were recorded to know their age in order to place them in chronological order.

c) The age of the students was recorded in completed years; the age of the selected students ranged from 14 to 16 years.

d) Measurement of height and weight of all the students was also recorded in terms of pound (gram) inches (c.m.).
II. **Tools and Techniques:**

Tools used in the study were the following:

1. Interview of the Principals/Headmasters, Physical education teachers and Students.

2. Adoption of the Physical Fitness Test introduced by the Government of India (NPET, 1960) for the National Physical Efficiency Test.

3. Instruments used in the Test included stop watches, whistle, clapper, Measuring Tap, Shot put (12 Pounds), Weighing Machine.

III. **Reasons for Using the above Tools:**

1. Interview with the Principals/Headmasters, PETs and Students was helpful in the selection of the sample. Information collected from the
Directorate of Youth Affairs and Sports, Government of Manipur were also reliable. Besides these, there was no other relevant method which could give an unbiased sample of the present investigation.

2. The Physical Efficiency Test of the Government of India is more or less standardised and is widely adopted by other workers in Indian condition. Hence this has been chosen here for the Test.

3. To match the influence of the home environment and school environment an information schedule could be constructed and data obtained with it. But such a schedule would require proper standardisation.

IV. **Description of the Test**:

The schedule of testing of physical fitness, called 'National Physical Efficiency Test', instituted by the Government of India in 1960 consisted of a number of items
for testing efficiency or physical fitness of individuals of different age groups. Each item of Tests had three standards which ranged from moderately easy to fairly difficult standards. The highest was the 'Three-Stars' standard, the next 'Two-Stars' and the easiest, 'One-Star'. The norm laid in the Tests was that those who passed/qualified in all the prescribed items at the 'Three-Star' level would be awarded a 'Three-Star Bage', specially designed for the purpose. Those who passed/qualified in all the 2nd items would get the 'Two-Star Bage', and those Passing/Qualifying in the third group would be awarded the 'One-Star Bage'. The efficiency and physical fitness of a subject would be determined by winning the prescribed Test-items.

V. Adoption of the NPET (1960):

Out of the Test series so prescribed, only four items were adopted in the present investigation. The four Test-Items included: 100 metres run, long-jump, shot put, and carrying a weight equal to One's own weight.
VI. **Tester Competency and Reliability of Tests:**

a) The criterion-measure chosen for testing the hypothesis was 'Physical Fitness'.

b) Physical fitness index of each subject was obtained by administering NPET(1960).

c) The score of physical fitness was the composite of four items of the Test.

d) To determine the reliability of physical fitness, the performance - Test of the subjects in the four items selected was conducted twice in two consecutive years.

VII. **Administration of Test:**

A. **'Initial Tests':**

The Tests have been administered to the selected group of students from those seven High Schools.
VIII. The Procedure of Tests:

Different procedures were followed in administering specific Test items by making full use of the available facilities and time.

Test Item No.1: 100 Metres Race:

The purpose of administering 100 metres race was to measure the speed. The method to be followed by the testing subjects was announced prior to the action. The score was recorded in seconds between 'go' and across the 'finish' line.

Test Item No.2: Long Jump:

The purpose of administering long jump was to measure the 'strength'. The facilities and equipments utilised in the Test included:

Outdoor jumping pit, measuring tape and a take-off (4 ft. long, inches wide), a well prepared and smooth approach about 100 ft. long and 4 ft. wide run-way.
The usual process of warming-up of the body before the action, and other instructions were given in advance.

Scoring in the test was recorded in feet from the jumping board to landing on the pit.

Test Item No.3: **Shot Put**:

The purpose of administering this test is to measure power.

The rules to be observed in carrying out the test were explained to the competitors of the three Trials. The best was recorded in terms of feet (metres).

Test Item No.4: **Carrying a Weight equal to One's Own Weight**:

The purpose of this test was to measure the cardio-respiratory endurance.
Instructions given to the competitors or students included carrying the load over the prescribed distance. The best of the two trials was recorded in yards in the distance covered say, 400, 300, and 200 yards (metres).

B. 'Final Tests':

Having administered the Tests described above to the selected students of the different Schools (in Manipur, on different dates, the results obtained were recorded. This formed the 'Initial Test'.

In order to have the Final Test, the students were first subjected to exercises to deduce the expected results.

For the sake of convenience in the present study, the author here, has chosen certain types of exercises, presuming that these exercises might influence development of strength, cardio-respiratory endurance, speed,
power, flexibility, agility, and the ability to coordinate the physical, physiological make-up of the whole body.

To examine the effect (influence) of exercises on the fitness of the boys, the investigator taught the selected exercises regularly, to the boys of the 'experimental group'. They were made to carry out the exercises regularly for 6 (six) months in their respective Schools during their physical education classes.

The exercises adopted are described as follows:

1. **Neck Firm Exercise**:

   **Procedure**:

   Standing with feet together, making the neck firm, bending hands at elbows, keeping palms on the back of neck (Fig. 11). In this position, bending head down, bringing elbows forward (Fig. 12). Returning to the starting position,
Making palms holding the neck. The exercise is done for 10 - 12 times. It strengthens the neck and ensures mobility of the neck girdle.

Fig. 11: Neck Firm Exercise (1st position).
Fig. 12: Neck Firm Exercise (2nd position).

2. **Hand Bending and Straightening Exercise:**

**Procedure:**

Standing erect with feet, bending arms at elbows, keeping them in front of the chest and raising at the shoulder level, palms facing down, finger tips touching (Fig. 13). In this position, using wrist power, pushing the wrists in front of the chest (Fig. 14). Extending arms forward until
they are made parallel to the ground, and extending arms sideways until they are made in line with the shoulder point (Fig. 15). This exercise is done for 10 - 12 times. It helps to strengthen the arms and ensures mobility of the shoulder girdles.

Fig. 13: Hand bending and straightening Exercise (1st position).
Fig. 14: Hand bending and straightening exercise (2nd position).

Fig. 15: Hand bending and straightening exercise (3rd position).
3. **Hand Bending, Straightening and Trunk Twisting Exercise:**

**Procedure:**

Standing erect with feet together, bending arms at elbows. Keeping them in front of the chest and raising them at shoulder level (Fig. 16). In this position, rotating the trunk to the left and then to the right, moving both arms together along with the trunk (Fig. 17 & 18). This exercise is done for 10 - 12 times. It helps to develop mobility of the trunk position and also flexibility.

![Fig. 16: Hand bending, straightening and trunk twisting exercise (1st position).](image)
Fig. 17: Hand bending, straightening and trunk twisting exercise (2nd position).

Fig. 18: Hand bending, straightening and trunk twisting exercise (3rd position).
4. Body Arching Forward and Backward Exercise:

Procedure:

Standing with feet apart, hands at the side, (Fig. 19), and swinging the arms forward and upward by arching back slightly (Fig. 20). Bending the trunk forward and touching the toes by keeping the knees straight (Fig. 21). Holding the position for a while and returning to the original position. This exercise is carried out for 10 - 12 times. It helps to develop back muscles of thighs and to strengthen the waist.

Fig. 19: Body arching forward and backward exercise (Standing position).
Fig. 20: Body arching forward and backward exercise (1st position).

Fig. 21: Body arching forward and backward exercise (2nd position).
5. Body Stretching Sideward Exercise:

Procedure:

Standing with feet wide apart, bending hands at the back of neck, holding elbow back (Fig. 22). Bending trunk to the left and touching left elbow on left knee, at the same time bending left knee and straightening the right leg (Fig. 23). Continuing the same procedure at the same time as in Fig. 23, at the opposite direction, touching the right elbow on the right knee. Returning to the starting position (Fig. 24). This exercise is done for 10 - 12 times. It improves the flexibility of the body.

Fig. 22: Body stretching sideward exercise (1st position).
Fig. 23: Body stretching sideward exercise (2nd position).

Fig. 24: Body stretching sideward exercise (3rd position).
6. **Hand Straightening and Trunk Twisting Exercise** :

**Procedure** :

Standing with feet apart, stretching arms forward, facing arms down (Fig. 25). Turning the trunk to the left side (Fig. 26) and then to the right side (Fig. 27). Returning to the starting position. Repeating the exercise for 10 - 12 times. It develops agility of the body.

![Image of people exercising](image-url)

**Fig. 25**: Hand straightening and trunk twisting exercise (1st position).
Fig. 26: Hand straightening and trunk twisting exercise (2nd position).

Fig. 27: Hand straightening and trunk twisting exercise (3rd position).
7. **Squating Exercise:**

**Procedure:**

Standing with feet slightly apart, keeping hands on hips (Fig. 28). Bending knees to a squat, raising heels and trunk erect (Fig. 29). Returning to the starting position. Repeating the exercise for 10 - 12 times. This exercise helps to develop strength and power of the lower part of the body in particular.

*Fig. 28:* Squating exercise (1st position).
8. **Legs Straightening and Trunk Twisting Exercise:**

**Procedure:**

Sitting on floor, straightening the legs wide apart, making the neck firm by hands on back of neck (Fig. 30). Turning the trunk to the left while holding the neck firm by arms (Fig. 31). Twisting with right elbow and twisting the trunk and bringing it close to the thigh, touching elbow
Fig. 31: Legs straightening and trunk twisting exercise (2nd position).

Fig. 32: Legs straightening and trunk twisting exercise (3rd position).
9. **Squating Position Exercise:**

**Procedure:**

Squating position, knee fully bending, heels, palm resting on either side of feet (Fig. 33 & 34). With a slight spring, stretching both legs backward, the body being supported on bands and feet and returning at the front to starting position (Fig. 35). This exercise is carried out for 10 - 12 times. It helps to develop and strengthen various muscles of the body.

![Image](image_url)

*Fig. 33: Squating position exercise (Ready position).*
Fig. 34: Squating position exercise (1st position).

Fig. 35: Squating position exercise (2nd position).
10. T - Position Exercise:

Procedure:

Standing with feet together, hands at the side (Fig. 36). Raising the body horizontally and bending trunk forward, at the same time raising left leg backward, keeping knee straight and hands extended sideways. The body is now supported on the right foot. Keeping the balance as in (Fig. 37). Repeating the position as in the earlier. Then, the right leg raising backward and balancing the body on the left leg (Fig. 38). Body balancing is done 1 to 2 seconds and returning to the starting position (Fig. 37). This exercise helps the body to maintain its balance.

Fig. 36: T - Position exercise (Ready for the start).
Fig. 37: T-Position exercise (1st position).

Fig. 38: T-Position exercise (2nd position).
11. **Legs Swinging Exercise**:  

**Procedure**:  
Lying on the back with legs straight, arms extending sideways on the ground. Raising right leg to vertical position and swinging across the body until it touches the floor on the left side. Returning to starting position and repeating the same with the left leg (Fig. 39 & 40). The exercise is done 10 - 12 times. It helps to develop the strength of the legs and trunk.

![Image of Legs Swinging Exercise](image)

**Fig. 39**: Legs Swinging exercise (1st position).
Fig. 40: Legs Swinging exercise (2nd position).
12. **Legs Raising Exercise:**

**Procedure:**

Lying in prone position with legs and arms straight by the side of the body. Raising legs and keeping knees extended. Holding the position for 8 to 12 seconds and returning to starting position (Fig. 41 & 42). Repeating the exercise with counts. It helps to strengthen the legs.

**Fig. 41:** Legs raising exercise (1st position).
Fig. 42: Legs raising exercise (2nd position).

Having given training in the above exercises, the Tests adopted were again administered to the trained students, and their performances were recorded. This formed the 'Final Test'.

The Initial and Final Test-Scores of all the Tests conducted are presented in Chapter - IV.