PROCEDURE
Chapter – III

PROCEDURE

In this chapter selection of subjects, selection of variables, collection of data, criterion measures, reliability of data, instruments reliability, tester reliability, reliability of the test, experimental design, experimental procedure, procedure of administration of the test and statistical technique for the analysis of data has been described.

Selection of the Subjects

For the purpose of study, two hundred male middle age people of Rishikesh (Jay Ram Asram) were selected as the subject. The subjects were selected by following procedure of random selection. The average age of the subject was from 40 to 45 years. The subject might belong to different socio economic groups and their background in terms of health components. Moreover, all the subjects was divided into four groups, three experimental and one control group, namely Yogic Group, Aerobic Group, Recreational Group and Control Group. Each group was comprised of fifty individuals. After the proper medical check up only then the training programmed was applied.
Selection of variables

Based on literary evidence, correspondence with the expert and scholar's own understanding the following variables had been selected for this study.

A. Health Related Physical Fitness Components

i) Muscular Strength
   a) Grip
   b) Leg
   c) Back

ii) Muscular Endurance

iii) Cardio Respiratory Endurance

iv) Body Fat percentage (Body Composition)

v) Flexibility

vi) Balance

B. Recreational modalities

i) Yogic Asanas Programme

ii) Aerobic Activity Programme

iii) Recreational Activity (Minor Games) Programme
Collection of data

The data was collected by administering the training programme of Yogic Asanas, Aerobic Activities and Recreational Games. The executive authority was consulted personally and their sincere co-operation was solicited. Data was taken at their respective Ashrams when they were not busy and had enough time to spare for testing. Necessary instruction was passed on to the subject before the administration of each test. Confidentiality of response was guaranteed.

Criterion Measures

i. The score of muscular strength made by the individual on grip, leg and back with dynamometer was recorded to the nearest kilogram as strength.

ii. Muscular Endurance was measured by knee bend sit-ups. The score was recorded as the total number of correct sit-ups in one minute.

iii. The cooper's 12-minute Run/walk measured Cardio respiratory endurance and the score was recorded to the nearest 50 meter converted into vo2max (ml/kg/min).

iv. Body fat was measured by the Lange skinfold calipers and the sum of the skinfold thickness of all the four sites of the body was converted into percentage body fat (Rehman and Durnin).
v. Flexibility was measured by Sit and Reach test. The score was recorded in inches.

vi. Balance was tested by stork stand test and score was made in duration of the maintenance of the balance on the ball of foot as described in test.

**Reliability of Data**

Establishing the instruments reliability, testing reliability, reliability of tests and subject’s reliability, ensured data.

**Instruments Reliability**

The Instruments used in the study were obtained from standard firms, which cater to the needs of various research laboratories in India and Abroad and their calibration were accepted as accurate enough for the purpose of the study.

**Tester Competency**

To ensure that the investigator was well versed in the techniques of conducting the test, the investigator had a number of practice session in the testing procedure under the guidance of the expert.

Tester competency was also evaluated together by reliability of tests.
Reliability of Test

The test retest method was employed to establish the reliability of the Health Related Physical Fitness Components Test. The tests were repeated on two days with an interval of one day in between. The reliability Coefficient of test-retest scores are presented in Table A

Table- A

Correlation of Coefficient(Test retest )scores

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Health Related Physical Fitness Components</th>
<th>Correlation of Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Muscular strength (Grip)</td>
<td>.91</td>
</tr>
<tr>
<td>1.1</td>
<td>Muscular strength (Back)</td>
<td>.84</td>
</tr>
<tr>
<td>1.2</td>
<td>Muscular strength (Leg)</td>
<td>.86</td>
</tr>
<tr>
<td>2</td>
<td>Muscular endurance</td>
<td>.94</td>
</tr>
<tr>
<td>3</td>
<td>Cardio respiratory endurance</td>
<td>.92</td>
</tr>
<tr>
<td>4</td>
<td>Flexibility</td>
<td>.91</td>
</tr>
<tr>
<td>5</td>
<td>Body fat percentage</td>
<td>.94</td>
</tr>
<tr>
<td>6</td>
<td>Balance</td>
<td>.90</td>
</tr>
</tbody>
</table>
Subject Reliability

The above test-retest coefficient of correlation method also established that subjects reliability was significant at .01 level of confidence as the same subject were under similar condition by the same tester and no motivational techniques were used nor any training imparted.

Experimental Group Design

The Pre Post Randomized Group design was used for this study. Four groups were made of subjects each comprising of fifty subjects; these subjects participated voluntarily in the study. The subjects who wanted to learn Yogic Asanas, Aerobic Activity, and Recreational Game and practiced were kept in experimental groups I, II, III respectively (N=50 in each experimental group). On the other hand subjects who opted to same as non experimental group IV were kept in Control Group (N=50).

Experiment Procedure

The study was conducted for a period of twelve weeks in the month of July, August and September. The climate condition was rainy (humid) and atmospheric temperature was raining from 27°c to 35°c.
## Schedule of Recreational Modality Programme for Three Months

### Recreational modalities for the first month

<table>
<thead>
<tr>
<th>Days</th>
<th>Experimental Group (I) Yogic Asanas group</th>
<th>Experimental Group (II) Aerobic group</th>
<th>Experimental Group (III) Recreational group</th>
<th>Non Experimental Group (IV) Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>6:30 AM</td>
<td>4:30 PM</td>
<td>6:30 AM</td>
<td>Free</td>
</tr>
<tr>
<td>Duration</td>
<td>20 min</td>
<td>20 min</td>
<td>20 min</td>
<td>Free</td>
</tr>
<tr>
<td>Activities</td>
<td>Basic Asanas</td>
<td>Callisthenic (slow)</td>
<td>Minor Games</td>
<td>No treatment</td>
</tr>
</tbody>
</table>

### Recreational modalities for the second month

<table>
<thead>
<tr>
<th>Days</th>
<th>Experimental Group (I) Yogic group</th>
<th>Experimental Group (II) Aerobic group</th>
<th>Experimental Group (III) Recreational group</th>
<th>Non Experimental Group (IV) Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>6:30 AM</td>
<td>4:30 PM</td>
<td>6:30 AM</td>
<td>Free</td>
</tr>
<tr>
<td>Duration</td>
<td>30 min</td>
<td>30min</td>
<td>30 min</td>
<td>Free</td>
</tr>
<tr>
<td>Activities</td>
<td>Moderate Asanas</td>
<td>Callisthenic(moderate)</td>
<td>Minor Games</td>
<td>No treatment</td>
</tr>
</tbody>
</table>

### Recreational modalities for the third month

<table>
<thead>
<tr>
<th>Days</th>
<th>Experimental Group (I) Yogic group</th>
<th>Experimental Group (II) Aerobic group</th>
<th>Experimental Group (III) Recreational group</th>
<th>Non Experimental Group (IV) Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>6:30 AM</td>
<td>4:30 PM</td>
<td>6:30 AM</td>
<td>Free</td>
</tr>
<tr>
<td>Duration</td>
<td>40min</td>
<td>40min</td>
<td>40min</td>
<td>Free</td>
</tr>
<tr>
<td>Activities</td>
<td>Moderate Asanas</td>
<td>Callisthenic (moderate)</td>
<td>Minor Games</td>
<td>No treatment</td>
</tr>
</tbody>
</table>
Administration of Test and Collection of the Data

Before administration of the test, the subjects were given a chance to practice the test so as to become familiar with various test items. The use of equipments was explained and clearly demonstrated prior to the administration of the test.

Muscular Strength

To find out the muscular strength scholar had taken three parts of the body that was grip, leg and back. ¹

Grip Strength

The subject is asked to hold the grip dynamometer overhead and to squeeze it by lowering the arm steadily downwards to the right side of the body while continuing tightening the grip without letting the hand, arm or elbow touch the body. The indicator needle gives the score for the maximum grip squeeze either in kilograms or in pounds.

Scoring:

The measurement was the best of two trails recorded to the nearest kilogram from the indicators needle of the grip dynamometer.

Leg Strength

The subject was standing by flexing both the knees; the handle of the dynamometer was placed on the thigh at the hip joint fold. The handle was supported by the hand crossing over the handle and was not allowed to

¹ Berry L. Johnson "Practical Measurements For Evaluation in Physical Education" Third Edition 1988 SurjetPublication pp.113
move or slip from the thing. The subject was then asked to extend the knees by keeping the leg straight.

**Scoring:**

The measurement was the best of two trails recorded to the nearest kilogram from the indicators needle of the dynamometer.

**Back Strength**

The subject was standing by both the knees straight; the handle of the dynamometer was placed on the thigh where tip of the fingers placed while the subject stands. The handle was supported by the hand crossing over the handle and was not allowed to move or slip from the thing. The subject was then asking to extend the trunk straight without jerking.

**Scoring:**

The measurement was the best of the two trails recorded to the nearest kilogram from the indicators needle of the dynamometer.

**Muscular Endurance**

Sit Ups (Knee Bend)\(^2\) was conducted to measure the Muscular Endurance. From a lying position on the back, the subject flex his knees as close to his seat as possible. The subject interlace the finger behind the neck and perform sit ups by touching the chest with knees. The exercise should be repeated as many times as possible.

\(^2\) Ibid pp.119-120
Scoring:

The total number of repetitions in one minute was recorded as the score.

**Cardio Respiratory Endurance**

Cooper's 12-minute Run/walk test\(^3\) was used to measure the cardio respiratory endurance. For this, the 400-meter track was marked into eight divisions of 50m each. The runner was started behind line, upon the starting signal, run/or walk as many laps as possible around the track within the 12-minute. The spotter maintained a count of each lap, and when the signal to stop was given, they immediately ran to the spot at which their runners were at the instant when the whistle was blown.

Scoring:

The score in meter was determined by multiplying the number of completed laps with the distance of each plus the distance of number of segment of an incomplete lap. Then this was converted into vo2max(ml/kg/min)

**Body Fat Percentage (Body Composition)**

The Lange skinfold Caliper\(^4\) was used to assess the body fat. The instrument consisted of accurately calibrated dial which indicated in millimeters the thickness of the skinfold when the jaws was open, holding

\(^3\) Berry L. Johnson "Practical Measurements For Evaluation in Physical Education" Third Edition 1988 SurjetPublication pp.184

\(^4\) Ibid pp228
the skinfold. The right side of the body will be used to determine the percentage of fat. The thickness of the skin and subcutaneous fat was grasped between the thumb and index finger and measurement was taken to the nearest millimeter from different specific sites using the calipers.

**Skin Fold Sides: (The Triceps, Subscapular, Bicep and Supra Iliac)**

**Triceps:**

A vertical fold was held midway between the right olecranon and acromion processes on the posterior of the shoulder. Position of subject with the upper arm flexed at a $90^\circ$ angle of the forearm using a tape measure, determine the distance between the acromion and the intension margin of the elbow along the side of the arm. Mark this point first one side, then on the back of the arm over the triceps muscle. The skin fold was picked up one centimeter above this mark and measurement is taken on the mid point.

**Subscapular:**

A diagonal fold, inclined (approximately 45) from horizontal, in the natural cleavage of the skin is picked up at the inferior angle of the scapula. The subject stood comfortably exist with the arm released at the sides of the body. The calipers joins are applied one centimeter below the thumb and index finger raising the fold.

**Bicep:**

The thickness of the double layer of the skin plus subcutaneous fat on the anterior side of upper arm over the bicep muscle at a level, mid way
between the point's acromiale and radiale. The subject with a necked arm is asked to stand at case with hanging arms. The mid point of the upper arm marked to measure the bicep fold picked at about one centimeter above.

**Supra-Iliac:**

A skin fold was lifted about one centimeter above and two centimeter medial to anterior superior iliac spine on the left side. The jaws of the skinfold caliper were applied parallel to the natural direction of the picked up skinfold which was usually horizontal or slightly oblique pointing upward laterally and downwards medially.

**Scoring:**

The sum of the skin fold thickness of four sites of the body was converted into percentage body fat with the help of standard table suggested by and M. M. Rahman and Durnin⁵

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**Flexibility**

Modified⁶ Sit and reach test⁷ was conducted to measure the flexibility of the subject. The subject was sitting on a mat with his knee straight, legs slightly separated and the feet pressed firmly against the scale. Then, the subject is asked to extend his arm forward with his hand, placing palm down

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on the upper surface of the scale. From this position the subject bent forward and maximum reach middle finger in bending forward is recorded.

**Scoring:**

The best of three trails was taken as the score to the nearest inches.

**Static Balance Test**

**Stork** Stand Test was used to measure the static balance on the ball of the foot. Instrument used to conduct the test was stop watch only. The performance was asked to stand on the foot on the dominant leg and to placed the ball of the other foot on the inside of the supporting knee. The subject was instructed to place the hand on the respective side of the waist then was informed that he would have to stand on the ball of the foot by raising from the floor on the signal start. The tester than announced ready, steady, start. On the signal start the subject raised heel from the floor to maintain the balance as long as possible without moving the ball of the foot from its initial position and the tester was started the stop watch. The performance was also encouraged to maintain balance with this best effect and not to let heal to touch the floor the longest duration. As soon as the subject was loosen the balance indicated either by touching the heel to the floor or by the movement of the foot from initial position. The tester stopped the stop watch.

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Scoring:

The score was given by the time in seconds for the duration of the maintenance of the balance on the ball of foot. Three trails were given. Only the highest score was recorded.

**Administration of Recreational Modality Programme**

Before starting the Recreational Modality Programme, each subject was medically examined properly by the doctor.

**Rules for all the Training Programmes of Experimental Groups I,II,III**

*(Yogis Asanas, Aerobic Activity and Recreational Activity)*

1. Do not eat for two hours before exercise
2. Drink a small amount of fluids before, during, and after a workout
3. Adjust activity according to the weather and reduce it when fatigued or ill.
4. Be realistic in our goals.
5. Combine exercises with any pleasurable movement and atmosphere.

**Instructions**

When exercising, one advised to listen to the body’s warning symptoms, and consult a physician if exercise induces chest pain, irregular heartbeat, undue fatigue, nausea, unexpected breathlessness, or light-headedness.
Warm-up and Cool-Down period for all Subjects

Experimental Groups I,II,III

Warming up and cooling down are important parts of any exercise routine. Scholar aided the body rest and making the transition from rest to activity and back again and could help prevent soreness or injury, especially in elderly people.

1. Warm-up exercises had practiced for 6 to 10 minutes at the beginning of an each training session. Elderly people need a longer period to warm up their muscles. Low-level stretching exercise, such as arm, leg, back, swinging the arms, or jogging in place was the best.

2. To cool down all the subjects walked slowly until the heart rate is 10 to 15 beats above resting rate specially after doing aerobic activity and recreational activity. Stopping too suddenly could sharply reduce blood pressure. This was a danger for elderly people, and might also cause muscle cramping. Breathe deeply during the cool of phase. For Yogic Asanas group cool down was done with Savasana for at least two minutes.

3. Stretching is appropriate for the cooling down period, but not for warming up because it can injure cold muscles.

Administration of Yogic Asana Training Programme

Asanas classes were stated early in the morning at 6:30 am in every alternate days of the week that was Monday, Wednesday and Friday. All the subjects were assembled in the Yoga hall of Jay Ram Ashram. Each subject
of experimental group was ready to learn Yogic Asanas. Teacher (An authorized expert of Yoga ) gave a demonstration to all the subjects .In first month ; first week subjects were taught four basic Asanas which were repeated in second week, in third week another four Asanas were taught and repeated next week. It means every 15 days subjects had to practiced same set of Asanas. In the second month same procedure was followed except the nature of Asanas.Moderate Asanas (little tuff ) were taught with following Surya Namaskar in the second month.In last month next moderate Asanas (little more tuff ) were taught with following Surya Namaskar .Each Asanas were practiced at least twice with both sides(left and right)

**Precautions for teaching Yogic Asanas to middle age people**

Following were suggested guidelines for practicing Yoga with elderly subjects.

Scholar was aware of health concerns and ability level for each of participants.

1. Always cue body alignment and posture. Also slow down the transition between poses. This could be accomplished by cueing each pose thoroughly, describing the positioning of each body part started the cueing at the top of the body, moving downward.

2. Reduced the length of time for which an asana was held. Middle aged participants may not have the strength required to hold the pose for a longer period of time but would again strength from practicing the pose even for ten or fifteen seconds. The pose was repeated twice.
3. Avoided the use of Sanskrit labels for the poses. Used of the English terms, is much less intimidating to the subjects. Using terminology that subjects understood and helped them to remember and master the poses.

4. Trained the subjects to focus their gaze in specific spot to assist with balance, this was especially important with older adults whose balance might be challenged. In rotational poses, advised to the subjects to focus their gaze toward the ground or straight ahead rather than upward.

5. Whenever scholar cued the class to stretch one area, cued them also to release tension in another.

6. Focused on the subject’s success. Encouraged them and praised their efforts. Created a supportive environment.

7. Offered plenty of options for each pose and be aware of the props scholar had available to assist with body alignment and balance, as well as to support and project joints.

8. Focused on poses which stretch and strengthen areas which were typically tight or weak in middle aged people. Ankles, hips, hamstring, low backs, and pectorals need special attention. Along these lines, be cautious of the weight that they put on their wrists as elderly people wrists are often weak.

9. Didn’t perform a lot of complicated poses, but always include at least one pose that was a bit more challenging.

10. Maintained proper fitness etiquette at all time.
Suggested poses/Asanas for Middle age People

Basic Asanas for first month. Four Asanas were practiced for fifteen days and next four Asanas for next fifteen days.

1. Parvatasana: Parvata means a mountain. This asana is also known as ‘Viyogasana’ because it involves a special technique of yoga. Only healthy persons should practice this asana.

Technique:

Sit in padmasana. Join the fingers interlock of both the hands. Stretch the arms vertically up over the head. Take deep breath in (inhale) while stretching upward, remain in this position for five to six seconds. Come down and exhale while coming down. Repeat this Asana thrice.

2. Pashchimottanasana

Technique:

Sit on the floor with the legs stretched straight in front. Bend the trunk forward and hold the feet with the thumbs and the first and middle fingers. Exhale, and bend the trunk lower so that the head rests on the knees. Draw the abdomen in while bending lower. This will make the bending of the trunk easy. While bending bring the head between the arms. The aspirants having flexible spine can touch the knees with the head at the first attempt. Remain in this asana for five to eight seconds.

3. Ardha Shalabhasana: Salbhasana means Locust. This asana is to be performed with one leg at a time and then changing it to the other leg.
Technique:

Lie on the stomach with the face down on the ground. Stretch both the arms beside the body and clench the fist lightly. The hands can also be placed under the thighs. Inhale and retain the breath till the completion of the asana. Pull the body and raise either of the legs by about 30 cms off the ground. Raise the leg as high as possible. Stretch the soles of the feet. Hold this position for five to thirty seconds. Then slowly bring the leg down on the ground. Exhale very slowly. Repeat this exercise with the other leg. This asana can be repeated six to seven times.

4. Tarasana

Technique:

Stand straight making an angle of $45^\circ$ between the feet. Keep the arms in front of you. Keep the palms facing each other and stretch the arms in the line with the shoulders. Then keep the palms downwards facing the ground and stretch the arms on the sides in the line with the shoulders. Then bring the arms upwards and keep the palms facing each other. Hold the position for two seconds at each stage. After completing the third stage bring the body to its original position. Repeat this asana three to four times.
5. Triconasana

Technique:

Stand erect with the feet facing forward about 2 to 2.5 feet apart. Raise the arms sideways. The palms should face downwards. Keeping the arms and legs straight, turn to the right through an angle of 45°. Next, bend to place the palm of the left hand beside the right foot. The right arm should be erect with the palm facing to the right. Turn the head to look at the right palm. Repeat the posture turning to the left. Practice three times.

6. Vajrasana:

Technique:

Bend the legs at the knee. Place the heels at the side of the anus in such a way that thighs rest on the legs and the buttocks rest on the heels. Support the whole body on the knee and the ankles. Breath normally while performing this asana. The knees and the ankle will perhaps ache in the beginning but this ache or pain will disappear by itself. Stretch the arms and place the hands on the knees. Keep the knees close by. Sit erect keeping the trunk, the neck and the head in a straight line. Hold this posture with ease for a longer time.

7. Naukasana: While performing this asana, the body takes the shape of a boat. So this asana is called Naukasana.

Technique:

Lie on the back. Keep the heels together. Put the hands on the floor by the side of the body. Raise both of the arms and legs up to 6 inches.
Inhale slowly. Slowly lift the both legs up. Hold the breath. Remain in this position for six to eight seconds. Then slowly lower the leg with put jerk and exhale. Take rest for six to eight seconds and practice this exercise with the holding leg. This asana should be practiced four times with both legs.

8. Gomukhasana:

Technique:

Place the left heel on the left side of the anus. Bend the right leg in such a way that the right knee rests on the left knee and the sole of the right foot touches the lower part of the left thigh. Practice will enable you to bring the right heel to the left thigh. Take the left arm to the back, bend it at the elbow and bring it upward. Now, raise the right arm, bend it at the elbow and take it to the back. Raise the first and the second fingers of the left hand. Lower the first and the second fingers of the right hand. If the fingers slip away, try again for two minutes to bring them to the position. Breathe slowly. Keep the trunk and the head in the straight line. Change the hands in turn. A fat man will find it difficult to perform this asana. But constant practice will enable him to practice the asana comfortably. Practice this asana four times in the first week. Later, gradually increase the frequency and practice it six times. Gradually increase the duration till the limit of fifteen minutes is reached.
**Moderate Asanas for Second Month**

**Surya Namaskarasana:** This asana signifies paying homage to (Lord) Sun deity. It is a graceful combined sequence of twelve positions. While practicing this asana recite the different names of sun God at each position:

**Technique:(1.)**

In the first position of Surya Namaskara, stand erect, open both the hands sideways and join them in the posture of Namaskar touching the chest. Push the chest out. Pull the stomach inwards. Fill the lungs with air. Look straight. Inhale and hold the breath.

**Technique:(2.)**

In second pose stretch the arms up and arch the body backwards from the waist, the eyes to remain open and look at the sky. Bend backward as far as possible. Expand the chest and push it forward.

**Technique:(3.)**

Continue holding the breath and bend down without bending the knees. Press the palms down on the ground, and the fingertips in line with the toes. The fingertips should touch one another. Then touch the knees with the nose or forehead without bending the knees and exhale through the nose only.

**Technique:(4.)**

Inhale. Take the right leg back and place the knee and the toes on the floor. Bring the left knee in front of the left armpit. Press the abdomen
properly. Now, bend the neck as far as possible throwing the chest out. Look up and the breath.

**Technique:(5.)**

Retaining the breath, move the other leg backwards. Place the toes, the ankles and the knees in such a way that they touch one another. Keep the head the waist and the elbow in a straight line. Support the weight of the body on the hands and the toes.

**Technique:(6.)**

Retaining the breath, Place the knees on the floor. Lower the chest so that it touches the ground. Let the chin touch the lower part of the throat. Lower the forehead so that it touches the ground. Pull the stomach inwards. See that it does not touch the ground .Then exhale. The chest should lie between the arms.

**Technique:(7.)**

Keep the legs, the knees and the palms in the same position. Stretch the arms .Inhale and push the chest forward .Bend the waist backward and bend the neck as back as possible .Look up and hold the breath.

**Technique:(8.)**

Retain the breath .Without shifting the palm and the toes, straighten the waist upwards and without bending the knees stretch the body back. Let the chin touch the chest. Pull stomach inwards. Stretch the thighs upwards. Rest the heels completely on the floor.
Technique : (9.)

Raise the trunk so that it is perpendicular to the floor and bring the left leg forward. Rest it at its original position and stretch the right leg backwards with the heels completely on the floor. The stomach should be pressed well in this position. Bring the neck and the head back and look as far back as possible.

Technique : (10.)

Assume the position as made in position no 3. Pull the stomach inwards. Bring the other leg to its original position. Let the nose or the forehead touch the knee. Exhale.

Technique : (11.)

Assume the position same as made in position no 2.

Technique : (12.)

Inhale and stand erect same as done in position no 1.

9. Bhujangasana: Bhujangasana means serpent. In this pose one imitates a cobra reared up on its caudal support and the hood fully expanded.

Technique:

Lie on the floor with the face downwards. Relax all the muscles of the body. Place the palm on the ground underneath the shoulders. Slowly raise the head and the trunk like the hood of the serpent. Bend the spine backwards. Stretch the feet backwards so that the toes touch the ground. This will stretch well the muscles of the back and the shoulders. There will be strain on the abdomen. Hold the breath and hold this position for six to
eight seconds. Then exhale and bring the head to its original position. When lie on ground keep the chin touching the chest. Hold the breath till the head remain in the raised position. Then exhale slowly. Practice this asana five to six times.

10. **Ardha Vakrasana**

**Technique:**

Sit on the floor the legs stretched in front ,keep the legs parallel to each other. Bend the right leg and place it behind the knee of the left leg. Place the left hand on the left knee. Place the right hand on the waist. Keep the trunk straight. Turn backwards on the waist remain in this position for six to eight seconds. Inhale slowly. Revert back to the original position. Practice this asana with the other leg stretched. Turning the trunk on the other side .

11. **Vakrasana**

**Technique:**

Sit on the ground with the legs stretched out .Place the left leg near the right knee, stretching out the left hand behind the back, with the right arm and put the palm on the ground. Keep the waist erect and look as far backward as possible. Practice this asana four to six seconds to the left side and to the right side alternately.
12. Akarna Dhanurasana

Technique:

Sit on the ground. Stretch the legs in front. Hold the toe of the right foot with the left hand. Hold the left leg with the right hand and try to stretch the right elbow backward as far as possible. Now bend the left leg slowly. Bring the left foot to the chin and the thigh close to the abdomen. Hold the breath and then exhale slowly. Repeat the pose on the other leg. Practice this asana six seconds.

13. Santulanasana: In this asana one has to balance the body on one leg, hence it is called Santulanasana.

Technique:

Stand straight and erect on the ground. Keep the arms on the sides. Bend either leg at the knee, keeping the knee facing downwards and the heel upwards. Hold the foot of this leg with corresponding hand. Raise the other arm close to the ear. Hold this position for eight to ten seconds. Repeat this asana with the other leg. Practice this asan four times.

14. Janu-Shirasana

Technique:

Sit on a ground. Place the left heel pressing hard near the left groin. Keep the leg stretched and straight hold the right foot with the hands. Exhale and draw the stomach in. Lower the head slowly. Place the forehead and the chin on the knee. Remain in this position for five to ten seconds.
15. Uttanpadasana: This asana is very useful for removing the excess fat of the body. It is like Ekapada Utanasana with the variation that in Uttanapadasana both the legs are to be lifted and lowered together.

**Technique:**

Lie flat on the back. Keep the arms by the side of the body. Keep the heels and the feet together. Inhale slowly. Then lift the legs up slowly retain this position for six to eight seconds. Hold the breath. Bring the legs slowly down on the floor. Exhale. Take rest for six to eight seconds and repeat the same. In the beginning practice this asana four times a day.

16. Purna-Pavanamuktasana: As its name suggests, this asana gives relief from excess wind in the belly.

**Tecnique:**

Lie flat on the back. Keep the heels of both the legs together. Inhale deeply and bend the hands. Raise the head above the ground and bring the chin closer to the knee so that it touches the knee-cap. Exhale and press the muscles of the right abdomen with the right thigh, keep the stomach pressed till the breath is suspended. While holding the legs with both the hands, exhale and control the breathing, then slowly begin inhaling while stretching the legs out.
Moderate Asanas (little more tuff) for third month

Surya Namaskarasan: Same as before

17. Utkatasana

Technique:

Stand with the legs together. Raise the body on the heels and bring the arms straight over the head and join the palms. Then slowly lower the trunk. This asana does not require much strength to practice it. An aspirant should only know how to balance the body. One who is slim but has a strong physique can practice this asana with ease and comfort.

18. Ardha Matsyendrasana

Technique:

Place the right heel near the anus (buttock) below the testicles. Do not move the heel from this position. Bend the left knee and put the left ankle on the outer side of the right knee. Let the right—pit rest on their outer side of the left thigh. Now push the knee backwards so that it touches the back part of the arm—pit. Then hold the toe of the left foot with right hand. Twist the spine solely exerting force on the joint of the left shoulder. Let the spine be twisted to the left side as far as possible. Turn the head to the left side as far as it can move normally. Move it to the line of the left shoulder. Take the left arm backwards and try to hold the right thigh. Keep the supine erect. Remain in this position for five to fifteen seconds. Repeat the same in reverse by twisting the spine to the right side.
19. Purna Shalabhasana

**Technique:** Lie flat on the stomach with the forehead touching the ground. Stretch the arms beside the body, then place the arms on the ground by the side of the chest, the palm facing the floor. Then raise the head, stiffen the body both the legs as high as possible. Stretch the sole of the feet. Pull the legs, the thighs and the lower part of the abdomen up. Hold this position for five to thirty seconds and rest the breath. Bring the legs down slowly and then exhale smoothly.

20. Natrajasana:

**Technique:**

Stand erect with both the legs straight. Keep the arms straight by the sides and look straight. Bend either leg at the knee and raise it backwards. Hold the foot with the corresponding hand. Stretch the other arm in the opposite direction and look straight in that direction. Hold this position for eight to ten seconds. Repeat this asana with the other leg and arm. Practice this asana four times.

21. Lolasana: This asana is also known as Utthita Padmasana.

**Technique:**

Sit in Padmasasana. Rest the palm on the floor besides the hips. Slowly raise the trunk without a jerk. The body should not quiver. Retain the breath inside and move the body forward and backward five times. Then stop and exhale. Practice this asana thrice.
22. **Vrukshasana**: Vruksha means a tree. In this asana the body assumes the shape of a tree.

**Technique:**

Stand on either leg. If different is experienced to balance the body on one leg, take the support of a wall. Bend the other leg at the knee and place its heel at the root of the thigh of the former leg. Join the palms and raise the arms straight over the head as if you are making an obeisance to the sky. Straighten the elbows. Inhale slowly. Hold this position for about ten seconds. Repeat the pose with the other leg. Practice this asana four times.

23. **Veerbhadrasana**

**Technique:**

Stand in a erect position. Apart both the legs and bend from me one side, stretch both the arms sideward at shoulder level. Now join both the arms upward, then inhale and shifting the body weight at the side of bending knee, lift the back leg upward to make balance & bring the arms (joint) infront of your head. Try to remain for five to six second. Repeat this asana with next leg also. Practice this asana twice.

24. **Dhanurasana**: Dhanurasana means a bow. The hands are used like a bow string to pull the head, trunk and legs and the posture resembles a bent bow.

**Technique:**

Lie prone on the floor on the stomach, face downwards. Relax the muscles. Keep the arms resting alongside the body. Bend the legs at the
knees. Raise the arms and hold the ankles with the hands. Raise the chest and the head. Fill the lungs with air. Straighten and stiffen the hands. Stiffen the legs also. The body now assumes the posture of a convex arch. If we lift the legs, we can raise the chest. Hold the breath. Then exhale slowly. Attempt to keep the knees together. Stay in this position for six to eight seconds. Practice this asana for five to six times.

Asana for Relaxation after practice Yogic Asanas

Shavasana: This asana is Yogic relaxation in the shortest possible time. After completing the practice of yogic asana all the subjects were go for this asana.

Technique:

Lie flat on the back. Place the hand little away from the thighs, with the palms up. Keep the eyes and the fists slightly closed. Stretch the legs 6 inches apart or out. Tilted the head any side of their choice. Close eyes and breath very slowly and deeply. Relax the brain during exhalation. Direct the attention to the breathing, to the soul and to God. After three minutes move the fingers of leg, move thighs, then move fingers of hand and then hands, open eyes slowly and then sit.

9 Dr. P.D. Sharma, "Yogasana and Pranryam for Health" Publisher Gala, 1989 pp16-112.
Aerobic exercises are those that require a steady supply of oxygen to sustain the energy giving powers of the muscles. An aerobic exercise is any activity performed for a minimum of 20 minutes maintaining a heart rate between 70%-80% of maximum heart rate with chief energy sources being oxygen and body fat. Aerobic exercises which were given to the subjects of Experimental group II usually categorized as low impact or moderate impact. All the subjects were assembled in the hall at 4:30 pm in every alternate days in a week that was Tuesday, Thursday and Friday.

**Low impact Aerobic exercises:**

Very first month research scholar had given activities such as walking slowly, brisk walking, stair climbing, step up slow pace rhythmic exercise and callisthenic exercises for fifteen minutes and five minutes for warming up. Brisk walking burns as calories as jogging for the same distance and poses less risk for injury to muscle and bone.

**Moderate impact Aerobic exercises:**

Next two months such as jogging, dance exercise, cycling, little fast (more than previous) rhythmic exercise with some equipments like dumbbells, Jogging in up hills and down hills and high knee action. etc were conducted in second month for twenty minutes, seven minutes for warming up and three minutes for cooling down. Moderate impact exercises should be performed same in third month only duration had increased for forty
minutes. Thirty minutes for main training programe and ten minute for warming and cooling down.

Administration of Recreational Activity Programme

(Minor Games)

1. Rama and Ravana/Crows and Cranes

Description: The teacher divides the group into two teams. One team is named as Crows and the other team is named as Cranes. Both the teams stand about a metre away from each other and the teacher stands in between the teams on one extreme end. The teacher says Raa,aa,aa,aama or Raa,aa,aa,aavna, in a prolonged manner. When teacher calls Rama the participants of Rama's team must run back and cross the safe line which is marked at the distance of about 10 mt.away. Simultaneously the participants of Ravana's team and try to touch the opponent participants of Ravanas team.

2. Fast Passing:

Description: Subjects were divided in two teams A and B. Players of each team were made to stand in respective circle and were told to pass the ball to each other as fast as possible in clockwise direction for a prescribed time limit of 5 minutes. The team having scored maximum number of rounds in given time was declared winner.

3. On The Line, Off The Line:

Description: Subjects were made to stand close to a marked long line and were told to move quickly either "On the line or Of the line" as per
command repeatedly. The subjects doing the contrary were considered out and the subject who remained at last was considered winner.

4. **Musical Chair:**

**Description:** Around twenty chairs were arranged in the circle according to the number of subjects. They were told to move clockwise around the chairs on music and were instructed to take chair only when music stopped. The number of the chairs were reduced solely in each round. The subjects kept on moving around the chairs anyone not finding

5. **London:**

**Description:** Out of all subjects one was chosen as “It”. He was made to stand 20 mt. away from the rest of the subjects who initially were standing in a single curved line. He was further made to speak L-O-N-D-O-N-London with face in opposite direction to the rest of subjects. While he was saying, the players were allowed to move forward.

6. **Partner Spud:**

**Description:** Subjects were divided into two, forming partner. Each pair was given a number. When number was called, either of the partner picked up the medicine ball and other subject ran away to avoid getting hit. The partners in possession of the ball were allowed to pass medicine ball between themselves moving into position where either can hit any player. Partner in possession of the medicine ball was not permitted to run but the one not having
7. Tug war:

**Description:** All the subjects were divided into three groups. First two teams were hold the rope with right and left side of middle line respectively. On the whistle both the teams would pull the rope towards themselves. The team which pulled the rope and another team crossed the middle line won the match. Now next team would come and do same again the team which won would be the winner of the competition.

8. Walking Race with Bucket:

**Description:** All the subjects were divided into two groups A and B. At the distance of twenty meter four buckets (two-two bucket for each team) full of water were kept. Both the teams were make separate lines. On the command “GO” one by one players were walked as fast as possible and bring the bucket without dropping the water and were given to next player standing on line. Now that player walked with bucket and kept it at same place and came back with fast walking and clapped to the hand of next player. The game was continuously move till all the players were not complete their chance. The team which finished the game earlier was winner.

9. Up and Down Passing the Ball:

**Description:** All the participants were divided into two teams A and B. Both the teams were make separate line by standing behind each other. They all were spread their legs. The first player of both the teams had a medicine ball of one kg. They had to pass the ball to other player without moving from
their place or turning. One player passed the ball throw bending from the waist and passed the ball between the legs. After receiving the ball that player passed the ball by standing and stretching the arms backward. This alternate process of passing the ball was followed by the next players. The last player received the ball and ran as fast as possible and stood infront of the line and again started. This process was continuously done till all the players were not come infront. The team which was completed earlier declared winner.

10. Cock Fighting:

**Description**: All the participants stand scattered in a circle. They raise their one leg up and hold the ankle of raised leg either with one or both hands. While hopping on one leg they try to push others either out of the circle or push so that the opponent looses balance. Any participant keeping both legs on the ground or going out of the circle or leaving hand/hands from the ankle becomes out. The one who remains not out till the end is the winner.

11. Back Through:

**Description**: The participants are divided into two equal teams. Both teams form a circle by joining hands. One participant from each team enters the circle formed by the other group. At signal from the teacher, each participant tries to break in order to come outside. The participant which comes first, earns a point for his team. This game continues until any five or ten subjects chosen.
12. Khan Bahadur Khan Sahab:

**Description:** All the subject sit in a circle when the Teacher said Khan Bahadur every one has to sit and when he says Khan Sahab every one has to stand in a squat position. This commands are given fastly. The player who will not perform according to command will be out from the game. This game will continue till the one player not left and that would be the winner.

13. Number Race:

**Description:** The participants are made to stand around outside the circle. They are asked to number in fours from a particular point till the end. The teacher makes sure that all the participants know their number. All the participants start walking in an anticlock wise direction. Suddenly, teacher says, 'Number three' which is a signal for all the three to run as far as possible outside the circle in anticlock wise direction. The Objective of the race is to touch the person who is running infront of you. After a round, the participants join in their respective places. Similarly, teacher calls any other number and the participants having the same number run from outside the circle. Trying to touch the person infront and getting back to their original position. If a participant infront is touched by the other player who was trying to touch would come out from the circle. This will be continue till the one player is not left.

14. Balloon Bursting:

**Description:** The teacher inflates the balloon and ties them with a thread of about 20 mt. The participants are made to stand behind the starting line. On a
signal, each participant tries to burst the balloon by hopping with both the legs. The team which burst the balloon more than other will be declared the winner.

15. Catching from the Back:

**Description:** The game is played in pairs. The teacher divides the class into pairs of almost equal ability. The partners stand facing each other at about an arm's distance. On a signal, the partner try to pull and push with the aim of catching the other from behind. Any one who is successful is the winner. The competition may be on best of three contest basis.

Rules: 1. Hard push is not permitted.

2. Second contest is organized when all pairs have completed the contest subject to a maximum period of one minute.

16. In-Out:

**Description:** All the subjects were divided into two teams. Both the teams will stand in two separate line facing each other. On the command "In" all the players have to jump with both the legs inside the line, and on the Command "Out" all have to jump outside the line. Teacher will give the command rapidly. Those who will not follow the command would be out of the game. The player who will remain till end of the game will be king of the game.

17. Leg football:

**Description:** All the players were divided into four teams. They had to play this game like cricket only the difference were in place of bat they had to use
their leg and in place of cricket ball there was football. One team was batting and other was bowling. The team which made maximum run was won the competition.

18. Football:

Description: All the players were divided into four teams. They had to play this game like football only the difference were the area of ground is small and in place of one ball, they had two balls. The team which made more goals than others were considered winner.\(^{10}\)

Statistical techniques employed for the analysis of data

To determine whether the experimental treatment (Recreational Modality Programme) was effective in bringing about a significant change in various components of Health Related Physical Fitness of experimental groups in contrast to the control group, an Analysis of co-variance technique was applied at .05 level of confidence. For this purpose the SPSS version 11.5 was used.

\(^{10}\) Dr. A.K. Dutta and Dr. Indu Mazumdar “Student Teaching in Physical Education” Janvani Prakashan Pvt. Ltd. Delhi – 2002.