CHAPTER III

MATERIALS AND METHOD

The present study was undertaken with a view to evaluate the efficacy of progressive relaxation on death syndrome and associated homeostatic imbalances in cancer patients. The methodology followed to conduct this scientific experiment has been presented in this chapter.

3.1 Research Process

This is an experimental research. According to the availability of the cancer patients, this piece of controlled study was planned.

The Subjects

Thirty (n=30) cancer patients of homogeneous disease group, age ranged from 18 to 40 years were selected purposively as sample from Bharat Sevashram Sangha, Vashi, New Mumbai, who were taking treatment in the Tata Memorial Hospital, Jera bai Wadia Road, Parel, Mumbai. To record case history of each patient, standard checklist was prepared and separate file was maintained to preserve the same. All the subjects were asked to sign the consent form, which was done as a standard procedure of conducting research study. It is amazing that almost all the subjects were belonging from West Bengal and staying at the Bharat Sevashram Sangha, Vashi, Navi Mumbai. Purposive sampling technique was used for sampling.

The distribution number of cancer patients, stages of suffering, and organs affected, on the basis of medical record of Oncologists, are as follows:
Organs affected | No. of Ss | Age (Yrs.) | Sex | Stage of Suffering
--- | --- | --- | --- | ---
Lungs Cancer | 10 | 18-40 | 10 | 0 | 8=Preliminary Stage 2=Advanced Stage
Brest Cancer | 17 | 25-35 | -- | 17 | 16=Preliminary Stage 1=Advanced Stage
Throat Cancer | 02 | 30-40 | 2 | 0 | 1=Preliminary Stage 1=Advanced Stage
Blood Cancer | 01 | 21 | 1 | 0 | 0=Preliminary Stage 1=Advanced Stage

**Criteria for Inclusion and Exclusion**

- As the patients were under treatment of the doctors of Tata Memorial Hospital, Mumbai, their suggestion was followed by the researcher to include the cancer patients in the experimental group.

- Patients committed to stay at Bharat Sevashram Sangha, Vashi, for at least 6 weeks were included in this experiment.

- Those who got surgical operation and kept under strict supervision of doctors, were excluded.

- Subjects suffering from any type /stages of cancer, as suggested by medical doctors (oncologists), were included.

**Drop-Outs**

During the experimental period the numbers of drop outs recorded were as follows:
<table>
<thead>
<tr>
<th>No. of Drop Outs</th>
<th>Reasons</th>
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<tr>
<td>Experimental Group</td>
<td>Control Group</td>
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<td>2</td>
<td>3</td>
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<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- Thus, up to 6 weeks of experimental period 3 subjects from experimental group and 4 from control group were dropped out.

- During follow-up period for next 6 weeks, all have left for their native place (i.e., West Bengal), and have returned back to Bharat Sevashram Sangha, Vashi (except 3 from experimental group and 2 from control group). Therefore, all the tests were conducted during follow-up.

**Experimental Design**

This is a parallel group design with one experimental group and one control group. The selected thirty subjects were then purposively assigned into two groups, viz., one experimental group (Group A: \( n_1 = 15 \)) and one control group (Group B: \( n_2 = 15 \)). In fact, those patients who are not interested in Yoga were kept in the control group, whereas the interested patients were placed into the experimental group.

Group A received ‘Medical treatment plus Yoga’ training while Group B was treated as control with their regular medical treatment. In fact, medical treatment of both the group was must as prescribed by doctors (oncologists) of Tata Memorial Hospital, Mumbai. The design of the experiment has been planned in four phases.

- Phase – I: Pretest,
- Phase – II: Training or Treatment,
- Phase – III: Post test,
- Phase – IV: Follow Up test
**Pre – Test (phase – I)**

As the purpose of this research study was to see the efficacy of progressive yoga relaxation on death syndrome and psychophysiological and haematological as well as neurological responses, all the subject of experimental and control groups were exposed to the selected variables to record the pre test data.

**Treatment stimuli (phase – II)**

After the pre test was over, all the subject of experimental group were exposed to a one – and half – month (6 weeks) training of yoga as progressive relaxation for 1 hour daily in the evening including Govt. holidays and Sundays.

- Group B (Control) – received only medical treatment.

For total period of 6 week one yoga teacher (professionally qualified) was appointed to organize daily training programmes (yoga as progressive relaxation) under the over all supervision of the present investigator.

**Post test (phase III)**

Finally, when the treatment or training period of 6 week was over, the posttest on the selected psychophysiological variables were assessed for all the subjects of both the groups.

**Follow-Up test (phase III)**

After posttest was over, all the patients were allowed to go to their native place, however some were still staying at the Bharat Sevashram
Sangha, Vashi. The investigator was so happy because all the subjects of experimental group given him thanks and most of them were really cheerful while departing. The researcher requested to all the subjects of the experimental group to continue Yoga practices whatever they learnt during the experiment and he promised to keep continuous touch with them. The follow-up period was for next 6 weeks. After the follow-up period was over, the researcher noted that almost all the subjects came back to Bharat Sevashram (Vasi). After this follow-up, the investigator could take the measurement on all the variables.

3.2 Variables Selected for the Study

3.2.1 Dependent Variables and Tools Used

Before and after experiment following tests of subjects were assessed with the help of some standard Psychological and Physiological tests:

A) Psychological Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tools Used</th>
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<tbody>
<tr>
<td>Anxiety</td>
<td>Questionnaire by Cattel &amp; Scheier (1963)¹</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>Krug and Laughlin (1984)²</td>
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<td></td>
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<tr>
<td>Adjustment</td>
<td>Sinha and Singh (1971)³</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Death Syndrome</td>
<td>Rajamanickam (1999)⁴</td>
</tr>
</tbody>
</table>


B) Physiological Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tools Used</th>
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</thead>
<tbody>
<tr>
<td>Heart Rate</td>
<td>BP Apparatus (Digital)</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>BP Apparatus (Digital)</td>
</tr>
<tr>
<td>Respiratory Rate</td>
<td>Stop watch &amp; observation</td>
</tr>
<tr>
<td>Breathing Style (Abdominal or Chest breathing)</td>
<td>Observation</td>
</tr>
<tr>
<td>Peak Expiratory Flow Rate</td>
<td>Wright’s Peak Flow Meter</td>
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C) Haematological Variables

<table>
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<tr>
<th>Variables</th>
<th>Tools Used</th>
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<tbody>
<tr>
<td>Haemoglobin</td>
<td>Hematology Analyzer</td>
</tr>
<tr>
<td>WBC</td>
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D) Neurological Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tools Used</th>
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<tbody>
<tr>
<td>Neuromuscular coordination</td>
<td>Finger Ergograph</td>
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<tr>
<td>Reaction time</td>
<td>Nelson’s scale.</td>
</tr>
</tbody>
</table>

The participants were found really encouraged to exhibit their best effort in each of the above tests.
3.2.2 Independent Variables

In this experiment, there was only one training intervention i.e., Progressive yoga relaxation that is the only independent variable.

Designing Yoga as Relaxation Training Schedule

Yoga programme was designed on the basis of following:

- Yoga is a science of body and mind which comprises a wide range of exercises and techniques. It has its origins in the East although it has been very much accepted and applied, in both pure and adapted forms, in the West. It is a thoroughly practical system which can profoundly help people in both everyday living and in exploring life’s deeper aspects. The techniques used include physical postures, meditative and breathing practices and deep relaxation. In its most diluted form, it has been presented and enjoyed as a fitness regime, successfully promoting health and physical well being. In its most profound form, it can awaken in people true wisdom, joy and compassion.

- Yoga does not promise results the easy, short cut way. It does not either promise quick fixes for all problems but it leads to positive results if followed in a systematic manner.

- According to medical scientists, yoga therapy is successful because of the balance created in the nervous and endocrine systems which directly influences all the other systems and organs of the body. Yoga acts both as a curative and preventive therapy. The very essence of yoga lies in attaining mental peace, improved concentration powers, a relaxed state of living and harmony in relationships.
• Regular yoga practice creates mental clarity and calmness, increases body awareness, relieves chronic stress patterns, depression, anxiety relaxes the mind, centers attention and sharpens concentration.

• Mental health and physical energy are difficult to quantify, but virtually everyone who participates in yoga over a period of time reports a positive effect on outlook and energy level. Yogic stretching and breathing exercises have been seen to result in an invigorating effect on both mental and physical energy and improved mood.

• Mediation is a means to still the mind’s restlessness. An invaluable tool in managing stress and anxiety. Regular meditation trains the mind to be calm, centered, relaxed and detached. This is extremely helpful while responding to stressful situations. It curbs overreaction, emotional outbursts and losing temper, thus giving the mind the time to rationalize and think about practical solutions. Pranayama and meditation have amazing capacity to reduce the stress inducing hormones. It restores calm, promotes positivism, and encourages patience and harbors compassion. It will keep one fresh and rejuvenated throughout the year both physically and mentally.

Training Method for Performing Progressive Yoga Relaxation

Independent variables representing progressive yoga relaxation for the experimental Group A were constituted with some yogic exercises, which were more classical (Kuvalayananda, 1933) in nature. Therefore, methods of performance were taken care on the basis of the following and with the suggestion of doctors treating these subjects.
• The very principles of yogasana as described in Patanjala Yoga Sutra (Karambelkar, 1989) were followed strictly by yoga experts. Thus, the subject performed the yoga practices steadily with comfort.

• Yoga exercises were performed by restricting the repetition to once only because there is no indication in either Patanjala Yoga Sutra or in Hatha yoga to repeat the asana several times. Thus, emphasizing the mastery over the practice of yoga exercises, the subjects were instructed to maintain them for a long time with steadiness and comfort.

• Treatment period for the subject was six weeks duration daily for one hour in the evening session.

• Asana were taught practiced in hall of Bharat Sevashram Sangh, Vashi, New Mumbai. In evening session 5.30 p.m. to 6.30 p.m. one experimental group was engaged and tackled by qualified yoga teacher. The subjects were suitably dressed for the purpose.

• Instructional part was totally looked after by qualified teacher and investigator himself.

• The control group was engaged in some light jobs of no physical adaptation value viz., Recreation activities daily during 60 minutes period when experimental group was practicing scheduled exercise as treatment stimulus. All other conditions were alike in terms of daily routine.

• Subject, in general, were interested and adoptive to the programme for a possible reason that they themselves volunteered for the project. None of the subjects came to the notice of investigator having a long history of practicing the selected exercises. Regularity in attendances was satisfactory.
3.3 Facilities Utilized

**Instrumentation**

Some of the instruments available in the Research Laboratory of the BPCA’s College of Physical Education, Wadala, Mumbai, were utilized. However, the investigator purchased the necessary raw materials and Kaivalyadhama’s Scientific Research Department was consulted to meet the need of all instruments for data collection.

**Man Power Facility**

Five associates having background of research in physical education and sports were involved on temporary basis for data collection.

Prior to data collection, the tester’s reliability was determined which was found statistically significant.

3.4 Description of Tests Measuring Dependent Variables

A) Description of Psychological Tests

**Anxiety Scale**

R.B. Cattell and I.H. Scheier, developed and standardized this “IPAT Anxiety Scale Questionnaire – A.S.Q,” which was published in U.S.A. by the Institute for Personality and Ability Testing (printed in India) in 1963. It measures anxiety level in adults and young adults. It can be repeatedly applied at weekly or longer intervals without examiners’ recalling any appreciable fraction of their earlier responses. The scale gives an accurate appraisal of free anxiety level, supplementing clinical diagnosis. It is easily administered individually or in a large group, easily scored with a standard key. It consists of 40 questions measuring 5 factors, viz., Q3-Defective
integration, Lack of self sentiment, C-Ego weakness, lack of Ego strength, L-suspiciousness or Paranoid insecurity, O-Guilt proneness & Q4-Frustration tension or Id pressure. Construct or concept validity is estimated 0.85 to 0.90 for total scale. Test-retest reliability is 0.98 (one week interval) and 0.87 (two weeks interval). Norms are given for general population, college group, high school group for men, women, and for both sexes. Time required about 10 minutes. Subject has to choose either a, b, or c answers. Mark b answer only when firm decision cannot be taken.

**Depression Scale**

Samuel E. Krug and James E. Laughlin developed and standardized this scale with a view to measure one’s depression level. The questionnaire is published by Institute for Personality and Ability Testing, U.S.A. It was first reprinted in India in 1984 by Psycho Centre, New Delhi. There were 40 items or statements in the test to know about how people feel or think at one time or another. There is no right or wrong answer. Choose one of the choices from a,b, or c which is really true for you. Scoring is done with the help of scoring key. Do not skip a single statement answer in the middle box, if you cannot give the firm answers in a or c. Time to complete this scale requires 10 minutes. Before administration this scale, a rapport is to be established. Calculate sten score from the raw score. Norms are available for converting raw score into percentiles. Reliability was 0.93 and validity was found to be quite satisfactory. Test is easy to administer and makes minimal time. Norms are available.

**Adjustment Inventory**

Dr. A.K. P. Sinha and R.P. Singh have standardized this scale, which was published by National Psychological Corporation, Agra (India). The test seeks to segregate normal from poorly adjusted people of all grades in respect of five areas of adjustment (Home, Health, Social, Emotional and
Educational). The poorly adjusted people may need further psychodiagnostic study and counseling. It has been prepared in Hindi and has 102 items. Reliability with Split half method, test-retest, Hoyt’s method, K-R formula were 0.94, 0.93, 0.94 and 0.92 respectively, whereas validity (product moment correlation) was 0.058. Separate norms are given for males and females classification or adjustment is done in terms of categories. Range of scores is also given as A-Excellent, B-Good, C-Average, D- Unsatisfactory, E-Very unsatisfactory. It is a self-administering inventory. There is no time limit but ordinarily individual takes 18 to 20 minutes. Scoring should be done with scoring keys.

**Death Syndrome**

Dr. Rajamanickam has standardized this scale, which was published by Rakhi Prakashan, Agra (India). It measures fear of personal death in adults and young adults. The scale consists of 40 statements, which fall under seven headings / sub-scale: 1) Reaction to death – the fear, 2) Deprivation of personal fulfillments, 3) Deprivation of companionship (social attachment), 4) Deprivation of relatives & friends, 5) Supernatural occurrences, 6) Destruction of the Self and 7) Retribution after death. There are 37 positive and 3 negative statements. This scale is developed on the pattern of Likert scaling technique. Therefore, it is a summated rating scale. Under each statement there are 5 response categories – totally accepting it, accepting it, no idea of it, not accepting it & totally not accepting it. Person has to read the statement carefully and mark the cross (X) on any of the cell below. Person has to answer all the statements. Scores may be given as 5, 4, 3, 2, 1 for positive statements, whereas 1, 2, 3, 4, 5 for negative statements. Higher score of the scale is 200 and lowest is 40. Scores may be distributed variables wise and sub-scale wise and treated. High score indicates strong or tense fear and low score indicates least fear or no fear. Scoring is to be done as per the key.
B) Description of Physiological Tests

1) Heart Rate

*Purpose:*

To measure heart rate.

*Method:*

The digital BP (blood pressure) apparatus, today, comes with specification to measure heart rate (HR). While measuring BP of a person, automatically it measures one’s heart rate. In fact, measurement procedure is same like BP. The details have been presented in BP measurement.

*Score:*

Heart Rate was measured in beats/ min.

2) Blood Pressure (BP) Test

*Description/procedure:*

The Digital blood pressure instrument is placed on a bench where the subject cannot see the display. Blood pressure is recorded after the subject has rested quietly for 5 minutes, and this measure should precede all other measures. The subject is seated with the arm resting on the bench, the elbow approximately at the level of the heart. The cuff is attached, the pressure then increased to approximately 180 mm Hg.

*Scoring:*

Blood pressure is recorded in the units of millimeters of mercury (mm Hg). Normal blood pressure is approximately 120 systolic and 80 diastolic, for both men and women.
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<thead>
<tr>
<th></th>
<th>acceptable</th>
<th>borderline</th>
<th>high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic</td>
<td>&lt; 140</td>
<td>140 - 160</td>
<td>&gt; 160</td>
</tr>
<tr>
<td>Diastolic</td>
<td>&lt; 85</td>
<td>85 - 95</td>
<td>&gt; 95</td>
</tr>
</tbody>
</table>

3) Respiratory Rate & Breathing Style

Purpose:

The purpose is to measure rate of respiration. We are not aware that when we breathe whether our chest moves up and down or our abdomen. While breathing if our chest moves we call it chest breathing and if abdomen moves it is known as abdominal breathing. Researcher calls it as style of breathing and hence wishes to measure the same at resting condition.

Method:

The subjects were directed to lie down at supine condition. The researcher asked the subjects about those to whom he / she likes very much. This was done to divert the subject’s attention because they should never know that the researcher is measuring respiratory rate along with breathing style. Here the researcher observed indirectly the movement of abdomen or chest.

Scoring:

The movement of abdomen or chest as noted should be recorded along with respiratory rate (RR) per minute in the score sheet.

4) PEFR (Peak Expiratory Flow Rate)

Purpose:

To measure peak flow rate that represents one’s lungs capacity.
**Method:**

Wright’s Peak Flow Meter was used to measure peak flow rate. The instrument was cleaned with purified liquid mixed with water and then the student was instructed to insert into the mouth in such a way that all the exhaled air must go out through the meter only. The lips are to be pressed tightly. The student then executes deep inhalation and performs fullest forceful exhalation through mouth i.e., through the Peak Flow Meter.

**Score**

The marked pointer moves with the exhaled air and indicates the score (lit./min.) in the scale.

**5) Haematological test** (Haemoglobin and WBC)

**Purpose:**

To measure the level of haemoglobin and WBC in blood.

**Blood Sample Collection:**

The blood for haematological variables was collected in EDTA vaccutainer by venipuncture.

**Assessment of Haemoglobin/White Blood Cell Count**

The haemoglobin and white blood cell count was assessed through BC-2300 automated haematology analyzer which was available in the clinical pathology laboratory. Although this instrument provides 19 parameters but we have considered only two parameters for this experiment according to the project protocol.

**Score:**

The score for haemoglobin was recorded in g/dL, whereas for WBC the unit of measurement was No./c.mm.
6) Neurological test

Two variables as selected in this study were neuromuscular coordination and reaction time. The method of measurement is as follows:

a) Measurement of Neuromuscular Coordination

**Purpose:**

To measure the level of neuromuscular coordination.

**Method**

Finger ergograph machine with hanging weight of 3 kg. and the Kymograph drum revolving at the speed of 60 mm/min. was used as a tool. The iron curtain was used between the drum and the subject so that subject could not see his own performance (graph) on the drum. Subjects were instructed to pull the weight and release it immediately by using the index finger at every beep sound of the electrical timer, adjusted at the rhythm of one beat/ sound. They were instructed to continue pulling as long as possible even after the onset of fatigue till the finger ceases to work any more.

**Score:**

The duration of total performance in neuromuscular coordination was recorded in Sec.

b) Measurement of Reaction Time

**Purpose:**

To measure subject’s reaction time.

**Method:**

The instrument used was an electronic reaction time chronoscope. It works on the principle of optical and acoustic effects. The Subjects’ speed and accuracy of motor response is measured as reaction time. The instrument generates light of (Red) and (Green) LED colors and sound stimulus of Tone...
or Buzz. It electronically records both visual and auditory response time through electronic counter. The reaction time measured in milliseconds range.

Score:

The duration of total performance of the task was recorded in Sec.

3.5 Composition and Description of Training Interventions

Following training was imparted to the experimental group for total of six weeks. Prior to preparing this schedule, many Yoga experts of Scientific Research Department of Kaivalyadham Yoga Research Institute have been consulted and their performance patterns / methods have been presented before a group of Oncologist of Mumbai (who were treating the subjects / the cancer patients participated in this study). Following Yoga practices were implemented as trial basis to the selected cancer patients and then they were finally selected.

Week-wise training schedule was as follows:

<table>
<thead>
<tr>
<th>1st Week</th>
<th>2nd Week</th>
<th>3rd Week</th>
<th>4th Week</th>
<th>5th Week</th>
<th>6th Week</th>
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<tbody>
<tr>
<td>2. Brahma Mudra</td>
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<tr>
<td>3. Parvatasana</td>
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<td>4. Gomukhasana</td>
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<td>5. Vajrasana</td>
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<td>6. Simha Mudra</td>
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<td>7. Crocodile Posture (2 practices)</td>
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<td>8. Pawanamuktasana</td>
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<td>9. Supta Tadasana</td>
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<td>10. Makarasana</td>
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<td>11. Niralambasana</td>
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<td>12. Vrikshasana</td>
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</table>

The description of above asanas and Pranayama is as follows:
A) Yogasanas & Mudras

1. Shavasana

Introduction:

In this asana the body remains completely relaxed on the floor. In Sanskrit “Sava” means “a dead body” and “Asana” indicates “a stable and comfortable posture.” This is a traditional asana mentioned in the Hathapradipka (I -32) and the Gheranda Samita (II-19).

Stages and Preparation:

- The starting position is resting on the back (supine decubits) with the legs together. The hands remain by the side of body with the palms resting on the floor.

- Slowly, separate the legs up to 30 or 40 cm. And stop there. Relax the feet so that the toes remain pointing outwards.

- Open the arms very slowly up to 30 cm. from the body and stop there. Relax the hands so that the palms are facing upwards.

- Then relax the head and the whole body. Close and relax the eyes. To concentrate, feel the heart, the touch of the air on the nostrils and the breathing movements.

- Keep a natural deep breath throughout the practice and go further relaxing.

- Maintain the posture for some time and come back to the initial position slowly by reversing the steps.
Salient points to remember

Do’s:

- Try to do all the movements very mindfully avoiding mechanical actions.
- In the final posture keep the feet open and the spine in a straight line.
- Maintain a natural breath throughout the practice.
- Keep the eyes closed if it is comfortable for you.
- Concentrate your mind to avoid dreaming and to maintain attention on the posture.
- Keep the head in line to prevent tension on the neck.
- Once you have adopted the complete asana try to move as less as possible.

Don’ts:

- Do not tilt the head while relaxing it.
- Do not jerk the body while opening the legs up or while opening the arms.
- Do not tense the elbows during the practice, keep them open and relaxed.
- Do not move the body after assuming a comfortable and stable position.
2. Brahmamudra

Introduction:

This posture it’s supposed to resemble the four heads of Lord Brahma (as the four Vedas), one of the Gods of Hinduism. In this practice, the person’s head is slowly twisted and placed looking to the left, right, back and forward.

Stages:

Starting posture – Sit down with legs folded in a comfortable position (preferably in Padmasana) with the back as straight as possible and front.

- Turn slowly the head backward as far as possible and relax. One may gaze at the tip of the nose if it is comfortable for. Keep the mouth closed and the head relaxed. Maintain for few seconds without forcing the posture.

- Slowly come to the center relax for a while, bring the head down and put the chin against the chest.

- Bring back the head to the initial position.

- Turn it slowly towards the left side (try to keep it vertical) and look to the left as far as possible.

- Bring it back to the central position again.

- Turn the head slowly to the right side in the same way. Remain there for a while and come back, Relax.

- This completes one round of Brahma Mudra.

Salient points to remember

- Sit in any comfortable position with straight but relaxed back. Place the hands on the knees and look in front.
• Do all movements very slowly and cautiously.

• Maintain the posture for two or three seconds in the beginning.

• Turn the head to the right or the left without bending.

• Try to keep the shoulders relaxed, moving only the head.

• If you feel uncomfortable with the eyes open, keep it closed and relaxed.

_Don’ts:_

• Do not bend the back while sitting.

• Do not jerk while moving.

• Do not overdo it.

• Do not bend the head while turning it to the sides.

• Do not force the eyes.

3. **Parvatasana**

_Posture:_

The body is stretched to look like a mountain peak and so it is called the Parvatasana (parvat means mountain in Sanskrit).

_Pre position:_

Sitting Position: Padmasana.

_Procedure:_

• Take both the hands forward and lock the fingers of both the hands together.
• Take the hands over the head and turn the palms downside up facing the roof. Stretch the body upwards with the arms stretched towards the sky.

• Stabilize the position and continue normal breathing.

Position:

In this asana stretching of the body is important but body is not actually lifted.

Releasing:

• Relax the body and bring the hands as in position 1 in figure above.

• Take the position as in Padmasana.

• Straighten the left leg in the knee then straighten right leg.

• Get both the legs together, take the sitting posture.

Duration:

One can maintain this asana for long time without any problem.

Internal Effects:

Stretching the arm, back and abdominal muscles improves the functioning of these parts of the body. This helps cure certain problems of spinal column & cord.

Precaution:

This asana is very simple and anyone can practice.

4. Gomukhasana

Placing both the feet on the ground by the side of the buttocks and keeping the body steady is Gomukhasana, resembling the mouth of a cow.
Technique:

- Sit erect stretching both legs together in front, hands by the side, palm resting the ground, fingers of the hands together.
- Fold right leg at the knee and place it on the ground by the side of the left buttock.
- Similarly bringing the left leg from above the right leg, place it on the ground by the side of the right buttock. The two soles will remain out towards left and right side.
- Place the palms on the knee one above the other and sit erect.
- Or place the right palm above the left sole and left palm above the right sole, so that it will resemble the shape of a cow's ear. Gaze in front.
- After some time return to the original position. Afterwards practise it by changing the position of the legs i.e. by placing the right knee above the left knee.

Remember:

- To start with, first place the right leg by the side of the buttock then left above the right.
- Hips remain straight.
- One knee should remain just above the other knee.

Benefit and Limitations:

- The practice of this Asana removes pain in hip and lower extremities.
- This helps in making the spine straight.
- This, Asana is very useful in arthritis and piles (dry).
• This gives exercise to the lungs automatically.

• Those suffering from bleeding piles should not practice it.

5. Vajrasana

Posture:

Like Padmasana, this is also the Asana for meditation. One can sit comfortably for a prolonged period in this Asana.

Pre position:

Sitting Position.

Procedure:

• Fold the left leg in the knee and place the toe on the floor.

• Fold the right leg in the knee and place the toe on the floor and join the two toes.

• Sit on the pit formed by the parted heels.

• Place the palms on the knees.

Position:

It is important to keep the spine, the neck and the head, upright in one straight line in this Asana. Keep the sight fixed at the level of the height. Don't have any pressure on the hands. The whole weight of the body be set on the spine. Continue smooth breathing, when the final position is attained.

Releasing

• Remove the palms from the knees and bring them to the sides.

• Take out the left leg and straighten it.
• Take out the right leg and straighten it.

• Take the sitting position.

**Duration:**

After a little practice, this Asana can be maintained for a long time. In the daily routine it should be kept for five minutes to experience good results. With more practice it can be kept for three hours.

**Internal Effects:**

Along with the body, the mind also gets stabilized in this Asana. Hence, it is preferred for meditation in this Asana. Hence, it is preferred for meditation and concentration. This Asana is also found to be good for Pranayama.

The special fold of the legs forms one Bandha in this Asana. Consequently the blood circulation in the waist - downward parts is controlled.

**Precaution:**

The people having stiff joints and whose movements have become difficult should practice this Asana with a lot of care. Such persons should practice this Asana after getting the joints free and relaxed.

**6. Simha Mudra**

Simha means Lion in Sanskrit, therefore assuming the form of a lion is called Simhasana.

**Technique:**

• Sit in Vajrasana.
• Then raise your buttock a little and cross the heel and toes of the right leg over that of left leg like a scissor.

• Sit on the heels and place both hands on the respective knees.

• Spread out the fingers. Bring out the tongue as much as possible. Gaze should be Nasal.

• While returning back to the original position, take the tongue in, release the tension, loosen your hands and come back to the original position.

**Benefits:**

Muscles of the neck are exercised and the blood circulation therein is improved. The thyroid is also made healthy. Tonsillitis of certain types is checked.

**Remember:**

The hands on the respective knees should remain straight and the chest should be erect. At the time of bringing out the tongue exhale from the mouth with some sound. After completion of exhalation maintain the position for few seconds. Practice it again after taking the tongue in.

**7. Pawanamuktasana**

**Posture:**

The knees and thighs are pressed against the chest and belly in this asana. The gas trapped in the large intestine gets released in this Asana. Therefore, it is called 'Pawanamuktasana'.

**Pre position:**

Supine Position.
Use:

Generally practiced to get rid of abdominal & gastric problems and improve digestion etc.

Procedure:

- Exhale and inhaling, start raising both the legs and come to Dwipada Uttanpadasana Position.

- Bend both the legs in the knees and keep the folds on the belly. Keep the knees and toes together.

- Now keep the belly pressed with the thighs and clasp the folded legs with both the hands.

- Now bending the neck, raise the head and fix the chin between the knees.

Position:

It is necessary to keep the knees and thighs pressed against the chest and belly in this asana. At the same time the calves should also be pressed against the thighs so that when the hands clasp the legs, the desired pressure can be had on the belly. The proper pressure on the concerned organs of the body gives the desired benefits.

Releasing:

- Straighten the neck and bring the head on the floor.

- Unfold the hands and bring them to their earlier position.

- Inhaling, straighten both the legs and come to Dwipad Uttanpadasana Position.
• Exhaling, slowly bring both the legs down and place them on the floor and take Supine Position.

*Duration:*

Generally it should be maintained for one minute. That way this asana can be retained longer but that is not necessary.

*Internal Effects:*

Due to the nice and systematic pressure on the belly, the trapped gases in large intestine are released. This improves the digestion system and helps have good motion.

*Precaution:*

People who have undergone an operation on belly or suffering from hernia and piles, etc. should perform this asana after consulting some Yoga Expert. Similarly, the pregnant women should also not practice it.

*Do’s & Don’ts*

*Do’s:*

• Keep the legs folded in knees and pressed on the abdomen using the folded arms.

• Try to touch the chin to the knees.

• Try to keep the legs together.

• Point the toes.

• Simple variation – keep the head on the ground instead of trying to touch the chin to the knees.

*Don’ts:*

• Do not strain your neck.
8. Supta Tadasana

'Tada' means a mountain and sama upright, unmoved. 'Sthiti' means standing still. 'Tadasana', therefore, implies a pose where you stand firm and erect like a mountain. 'Tada' also means a palm tree growing straight. This is the basic standing pose.

**Technique:**

- Remain as natural as you are when standing.
- Keep the feet together, toes and inner heels touching and the arch raised.
- Rest the feet flat on the ground and stretch all toes.
- Heels should not come off the floor and the weight should be exactly in the center of the feet.
- Tighten the knees and pull up the kneecaps. Compress the hips and pull the muscles at the back of the thighs up.
- Keep the spine erect, raise the sternum and expand the chest.
- Keep the stomach in and the neck straight.
- Do not lift the shoulders when you keep the arms by the sides of the body, fingertips extending downwards and palms facing the thighs.
- Stand still for 20 to 30 seconds and breathe normally.

**Special Instructions:**

Most people don't pay attention to the correct method of standing. Some take the body weight only on one leg or stand with knees bent. Others
protrude the abdomen or keep the feet at an angle. These can result in deformities hampering spinal elasticity, which affect the mind.

**Benefits:**

Tadasana is useful for an alert body and mind. It induces lightness and agility. If practiced as in the picture here, it also relieves stiffness in shoulders and back and tones ankles and knees.

**9. Makarasana**

**Introduction:**

It is a traditional relaxative posture mentioned in the Gheranda Samhita (II 40) in which the body rests looking down in Sanskrit “makara” means “crocodile” and “asana” indicates “a stable and comfortable posture”. In the final position this asana imitates the stand of a crocodile. It is a good complementary posture for the asanas that are performed looking down.

**Stages:**

**Preparation:**

- The starting position is resting on the chest (prone decubitus) with legs and toes together.

- The arms remain by the side of the body with the hands relaxed and the chin on the floor.

- Very slowly open the legs and place the feet pointing outwards (heels inside and toes outside).

- Feel the abdomen resting in close contact with the floor.

- Bring up the chin, raise the head and stretch the arms in front. Place each hand on the contrary shoulder. One from below and the other
from above, so that one arm rest on the other and they form a double triangle, keep the body in line.

- Situate the forehead over the elbows comfortably. Take care that the head is in line with the spine and balance it.

- Maintain the posture comfortably for some time according to one’s capacity. Put the attention on the muscles and the breath.

- Come back to the initial position slowly by reversing the steps.

**Salient Points to Remember:**

**DO’s:**

- All the exercise shall be done very smoothly and slowly.

- Maintain a normal breath through the practice.

- Open the legs comfortably and feel the abdomen.

- Keep the elbows apart if it is difficult to place one over the other.

- Focus the attention on the breath.

**Don’ts:**

- Do not force the arms to reach the final position.

- Do not open the legs too much on the floor.

- Do not press the nose, chest or elbows.

**10. Vrikshasana**

**Posture:**

A tree is always in a standing position, remains stable and grows upward. The similar process is involved in this asana and hence it is called Vrikshasana.
Pre position:

Standing Position.

Procedure:

• Exhaling and inhaling take both the arms up above the head from the sides and join the palms at the top.

• Lift the heels and stand on the toes and pull the whole body upward. Continue smooth breathing.

Position:

Except the toes, the whole body right from the heels to the fingers of the hands is stretched upward. Pull the hands upward as much as possible. The more the body is kept stretched, the more it is possible to keep the balance. Keeping the legs stable, one should pull the body upward, thinking that he is being pulled up by some force. Taking the asana position continues smooth breathing, and keep the sight and the mind fixed, as looking here and there will disturb the balance of the body.

Releasing:

• Inhale and exhaling bring both the hands down from the sides.

• Bring the heels on the floor and take up standing position.

Duration:

As this asana involves balancing, it is enough to maintain it for one minute. To have certain special results, one should increase this duration to three minutes.

Internal Effects:

In this asana all the muscles are stretched in one direction at one time and then relaxed. This process helps to remove all the strains. The muscles get
rest and relaxation and even the earlier strains caused by other asanas get removed.

**Precaution:**

The asana being simple there is nothing to bother. However, while stretching the body upward, one should take care to maintain the balance.

**B) Pranayama & Meditation**

1. **Anuloma-Viloma**

**Technique:**

- Sit in Padmasana. Fold your index and middle finger of the right hand towards the palm.

- Thumb should remain towards the right nostril. Ring finger and little should be towards left nostril.

- Close the left nostril with the thumb and inhale through the right nostril.

- Now close the right nostril with ring finger and exhale slowly through left nostril.

- The time of exhalation should be double than the time inhalation.

- Now inhale through the same nostril (left nostril).

- Close right nostril the thumb and exhale through the right nostril. This completes one round of anuloma viloma pranayama.
2. Sitali

This pranayama should be practiced for curing the diseases of the throat and tongue. This has good effects on a sore throat and tonsils. If there are eruptions on the face, the tongue is dry and cracked, this pranayama should be practiced regularly everyday as a cure.

*Technique:*

- Sit in Asana and take out the tongue and twist it so as to form a channel or a round tube and breathe in.
- The breath should be taken in slowly and gently so as to fill up the lungs completely.
- Then do Rechak through the nose. While doing Rechak, the tongue should be taken in.
- Again Poorak with tongue should be taken out in the shape of a tube and then Rechak with the tongue inside through the nose is to be repeated. This should be practiced 8 to 10 rounds everyday.

*Benefits:*

By attaining perfection in sheetali pranayama, one can control hunger and thirst. Cough, biliousness, constipation and indigestion are all cured.

3. Omkara

Omkara dhyana involves meditation on Om, the shabda-bramhan (Bramhan in the form of a word or sound). The technique to perform this dhyana is as follows:

- Sit in any meditative posture with spine and head erect.
- Close your eyes and relax the whole body.
• Spend a minute or two in breath awareness.

• Now visualize a bright orange or blue colored Om at the eye brow center.

• Simultaneously start chant Om mentally.

• Let the visualization and chanting be uninterrupted.

• Be in this position as much as you can.

This dhyana gives a feeling of divine bliss if done correctly. You may find that Om is changing its color and size on its own. Sometimes Om may get substituted by bright light on its own. This is perfectly normal. After some practice you will find that your practice becomes steady and yields bliss and joy that cannot be explained in words.

4. Gayatri Mantra Recitation

Mantra basically consists of three parts:

1. Praise,

2. Meditation, and

3. Prayer.

While chanting the mantra, first praise the God or the Divine Power, meditate upon it in all reverence and then finally pray or make an appeal to the God awaken and strengthen the intellectual powers of a person. The Mantra is said to be the embodiment of all deities and is certainly not associated with any particular religion or sect, time, place or person. While Om, Bhuh, Bhuvah, Swaha, Thath, Savithur, Varenyam, Bhargo and Devasya are said to be its nine colors or praise of the Divine, Dheemahi is related to
meditation and Dhiyo, Yo, Nah and Prachodayaath are said to be the parts of the prayer aspects of the mantra.

'Gayatri' is not actually the Goddess, which sounds surprising but she is held in equal reverence because she is the mother of the Vedas or Divine Knowledge. The other two forms of Gayatri are Savitri and Saraswathi and these three are said to be present in everyone, in which - Gayatri is said to be the one to control the senses of a person, Savitri controls the Prana or the Life Force of a person and Saraswathi controls Speech of a person. Thus, the three together represent the purity in thought, word, and deed. In the same order, Gayatri is said to enhance one's intelligence and intuition by recitation of the mantra, Savitri is said to protect the life forces and Saraswati is said to guard one's speech.

It is said to have power to protect one from any possible harm. Even the science-minded Westerners have found that the correct recitation of Gayatri Mantra in the right accent as described in the Vedas produce certain vibrations that make the surrounding atmosphere visibly illumined, which is described as the 'Brahmaprakasha' or Effulgence of the Divine by more staunch believers. As prescribed by the Vedas, Gayatri mantra must be chanted at least three times a day during morning while taking bath, noon before eating lunch and evening at the time of sunset to cancel out all the sins that one may have done all through the day unknowingly. However, it is best to recite Gayatri period during the 'Satwik' or 'pure and serene' period during the day from 4 am to 8 am and 4 pm to 8 pm. The Gayatri Mantra should be recited while meditating upon the fact that everything is within oneself and thus, we should keep and develop confidence in the Self.

5. Trataka

Trataka is a deceptively simple but powerful practice. Trataka means 'to gaze steadily at a fixed point' and there are two forms of the practice. One
is 'bahiranga' or external trataka and the other is 'antaranga' or internal trataka. Bahiranga is easier to practice because one simply has to gaze at an object or symbol. However, antaranga trataka involves clear and stable inner visualization of an object.

Practice in a dark room which is free from drafts and insects - place a candle at arms length in front of you with the flame at eye level - it is important that the flame does not flicker in the least - sit in a comfortable meditative pose, preferably siddhasana/siddha yoni asana and place the hands on the knees in either gyana or chin mudra - relax your whole body, close your eyes and prepare yourself as for any meditative practice - make yourself cairn and quiet and be prepared to keep your body perfectly still throughout the entire practice - practice kaya sthairyam for a few minutes - open your eyes and gaze at the middle portion of the flame (ideally one should focus on the red tip of the wick as it does not move due to draft) - gaze for as long as possible without blinking and without strain until the eyes begin to water or tire - you will be able to increase the time gradually with practice to ten minutes - remain the silent witness (sakshi) throughout, observing all thoughts and feeling which may arise - when you close your eyes keep them fixed an the impression in chidakasha - if the afterimage moves, bring it back to the centre and continue gazing until the impression disappears -once you can stabilize the afterimage, study it and look intently at its colour.


Posture:

Sitting

Procedure:

Palms are kept open and tips of the thumb and index fingers of both the hands are joined together forming a circle in between them. Remaining 3
fingers are kept together and relaxed. This position of the hands is called Dhyana Mudra.

**Position:**

In sitting position wrists of the hands in this Dhyana Mudra posture are kept on the respective knees and palms facing upwards.

### 3.6 Procedure of the Study

In fact, the experiment was conducted in four phases viz., Phase I - Pre Test, Phase II – Training, Phase III – Post Test, and Follow-Up.

The investigator conducted the pre test after receiving the consent in writing form from the patients. The age of each patient participated in experiment was confirmed from the medical record. Each subject was given individual code number i.e. Case number and record card prepared by the investigator so that they can be identified easily.

All the subjects were strictly instructed to arrive each station made for collecting data. Two professionally qualified and trained assistants controlled each station.

Demonstration of the test and question asked by the subjects were given and explained. They were also motivated properly.
Standard procedures were followed for testing the selected variable. Then the group division was made randomly into two groups. Name list of the two groups was also prepared.

The subjects of the experimental group were undergone special yoga training in addition to their regular medical treatment suggested by doctor (oncologist). The yoga training was given in the evening every day in a week including Sundays and even Government holidays. The duration of each class was 60 minutes.

Attendance of the subjects was taken regularly and the percentage of attendance after completion of training was found more than 80%. However, in a regular class the subjects were demonstrated and explained new yoga practices that were introduced. The questions, if any, asked by the subject were clarified. They were also motivated properly.

After completion of 6 weeks of experimental period, post-test was conducted like pre-test, where the subjects, who were present in the campus of Bharat Sevashram Sangha, were strictly instructed to arrive at each testing-station made for collecting data on the selected variables. Same procedures, as followed in pre-test, were performed for tests administration among the subjects belonging to their respected groups.
Further, a Follow-Up study for next 6 weeks was conducted after post-test. Here there were some drop outs, which have been noted. Finally, the data of follow-up test on the remaining subjects were recorded systematically for statistical analysis.

3.7 Statistical Analysis

Descriptive statistics have been applied to process the data prior to employing inferential statistics. Factorial ANOVA (analysis of variance) was then applied to analyze the pre-post-test as follows:

- For analysis of psychological variables, 2 x 3 x 4 factorial ANOVA;
- For analysis of physiological variables, 2 x 3 x 6 factorial ANOVA;
- For analysis of haematological, 2 x 2 x 3 factorial ANOVA;
- For analysis of neurological, 2 x 2 x 3 factorial ANOVA;

The related differences were recorded and completed to test hypotheses by employing Scheffe’s post hoc test.