

CHAPTER III

METHODOLOGY

The purpose of the study was to find out the effect of different packages of psycho-somatic regulative programmes on selected psychological and physiological variables among engineering college women. In this chapter, selection of subjects, experimental variables tester reliability instrument reliability, orientation of the subject, test administration and statistical techniques were discussed.

3.1 SELECTION OF SUBJECTS

One hundred and twenty five engineering college women students were selected from (Velammal Engineering College, Sri Ram Engineering College, Gojan Engineering College, Jaya Engineering College and S.A. Engineering College in Chennai. The subjects were selected at random, they were in the age group of 18 to 21 years.

The requirement of the experiment procedures, testing as well as exercise schedules were explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. The investigator got individual consent from each subject. The obtained written informed consent form each subject.

3.2 SELECTIONS OF VARIABLES

The research scholar reviewed the various scientific literatures pertaining to different package of psycho-somatic regulative programmes of selected psychological and physiological variables from books, journals, periodicals, magazines and research papers. Taking into consideration of feasibility criteria, availability of instruments and the resent study the following variables were selected.

3.2.1 DEPENDENT VARIABLES

The following psychological and physiological variables were selected as dependent variables.

PSYCHOLOGICAL VARIABLES

1. Self Confidence
2. Emotional Adjustment
3. Assertiveness
4. Inter Personal Relationship
5. Stress Management

PHYSIOLOGICAL VARIABLES

6. Vital Capacity
7. Resting Heart Rate
8. Blood Pressure
9. Breath Holding Time
10. Respiratory Rate

3.2.2 INDEPENDENT VARIABLES

- i. Twelve weeks of Psycho-Somatic Regulative Programme-
Yogic Practices.
- ii. Twelve weeks of Psycho-Somatic Regulative Programme-
Jacobson Progressive Muscular Relaxation Technique.
- iii. Twelve weeks of Psycho-Somatic Regulative Programme-
Physical Exercises.
- iv. Twelve weeks of Psycho-Somatic Regulative Programme-
Combination of Yogic Practices, Jacobson Progressive
Muscular Relaxation Technique and Physical Exercises.

3.3 EXPERIMENTAL DESIGN

The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects (N=125) were randomly assigned to five equal groups of twenty five women students each. The groups were assigned as Yogic practices group (YPG), Jacobson Progressive Muscular Relaxation Technique group (JRTG), Physical Exercises group (PEG), Combination of Yogic practices, Jacobson Progressive Muscular Relaxation Technique and Physical exercises group (CTG) and control group (CG) respectively. Pre-tests were conducted for all the 125 subjects on selected psychological variables and physiological variables. After the experimental period of twelve weeks, post-tests were conducted and the scores were recorded.

The subjects were given respective training to the subjects Five days 12 weeks Monday to Friday except Saturday and Sunday from 6.00am to 7.00am. Exercises were introduced in progressive manner simple to complex procedure was adopted.

3.4 PILOT STUDY

A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load for this twenty five engineering college women students selected random for the subjects and they were divided into five groups for this were selected yogic practices, Jacobson Progressive Muscular relaxation technique, physical exercises and combinations of yogic practices, Jacobson Progressive Muscular relaxation technique and physical exercises given to them.

Based on the response of the subjects in the pilot study and during the training, the training scheduler for Yogic Practice group, Jacobson Progressive Muscular Relaxation Technique, Physical Exercise and Combined group were constructed the training programmes and the principles of training [Progressive, overload and specificity] were followed the number of repetitions assigned to each subject was tested and it was found that they were within the reach of the individual's capacity.

3.5 CRITERION MEASURES

By glancing the literature and in consultation with professionals and experts, the following variables were selected as the criterion measures in this study.

1. Self Confidence
2. Emotional Adjustment
3. Assertiveness
4. Inter Personal Relationship
5. Stress Management

The selected psychological variables were measured using Personality Development Index Questionnaire developed by kaliappan, 1993.

6. Vital capacity was measured through spirometer. (Johnson and Nelson, 1982)
7. Resting Heart rate was measured through Digital Heart Rate Measuring Machine, Model No. EW 243, manufactured by National Company, Japan (Roberges and Landwehr, 2002)
8. Mean Arterial Blood Pressure was measured through Systolic and Diastolic blood pressure as suggested by Mathews and Fox (1985)
9. Breath Holding Time was measured using nose clip and stop watch as suggested by Mathew, (1978).
10. Respiratory Rate was measured using bio-monitor as suggested by Kamrul, (2008).

The table I shows the variables selected, testes/tools administered to measure the variables and unit of measurements.

Table – I
Name of Variables Test/Tools Administered and the Unit of Measurement

S. No.	Variables	Test/Tools Administered	Units of Measurement
	Psychological Variables		
1	Self Confidence	PDI Questionnaire	Scores
2	Emotional Adjustment	PDI Questionnaire	Scores
3	Assertiveness	PDI Questionnaire	Scores
4	Interpersonal Relationship	PDI Questionnaire	Scores
5	Stress Management	PDI Questionnaire	Scores
	Physiological Variable		
6	Vital Capacity	Spirometer	Milliliters
7	Resting Heart Rate	Digital Heart Rate Machine	Number of Beats
8	Blood Pressure	Sphygmonometer	Mm/Hg
9	Breath Holding Time	Nose Clip & Stop Watch	Seconds
10	Respiratory Rate	Bio Monitor	Number of Beats

3.6 RELIABILITY OF DATA

The reliability of data was ensured by establishing the instrument reliability, testers competency and subject reliability.

3.6.1 INSTRUMENT RELIABILITY

Japan made stop watches calibrated to 1/100th of second were used in this study for recording timings and this stop watch times were compared with other watches in different situations and they were considered reliable. A standard steel tape was used to measuring the test; All the instruments and laboratory equipments used were standard and therefore their calibration were accepted accurate enough for the purpose of the study

3.6.2 TESTER'S COMPETENCY

Reliability was established by the test re-test processes. Subjects from all the five groups were tested on selected variables. The repeated measurement of individuals on the same test is done to determine reliability. It is a univariate not a bivariate situation, it makes sense then to use a univariate statistics like the intra class correlation coefficient (Baumgartner and Jackson, 1975).

The intra class correlation coefficient obtained for test-retest data are presented in Table II.

Table II
Intra Class Correlation Coefficient of Test-Retest Scores

S. No.	Variables	Coefficient of Correlation
Psychological Variables		
1	Self Confidence	0.80*
2	Emotional Adjustment	0.88*
3	Assertiveness	0.92*
4	Interpersonal Relationship	0.86*
5	Stress Management	0.87*
Physiological Variable		
1	Vital Capacity	0.91*
2	Resting Heart Rate	0.76*
3	Blood Pressure	0.79*
4	Breath Holding Time	0.81*
5	Respiratory Rate	0.76*

*Significant at 0.05 level

The reliability and validity of the Personally Development Index used to measure Self confidence, Emotional Adjustment, Assertiveness, Inter

Personal Relationship and Stress Management of the engineering college students were determined by the author (Kaliappan, 1993) and was treated enough for the purpose of this study.

3.6.3 SUBJECTS RELIABILITY

The intra class correlation value of the above test and retest also indicated subject reliability as the same subjects were used under similar conditions by the same tester. The co-efficient of reliability were significant at 0.05 level, for the above test under investigation.

3.7 TRAINING PROGRAMME

Table III

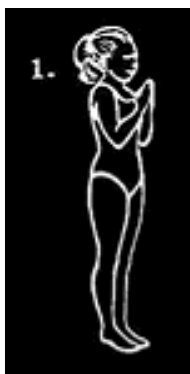
Experimental Group I

Psycho-Somatic Regulative programme of Yogic Practices

Day	Programme	Duration
Mon Day	Asanas and Relaxation	60 Minutes
Tuesday	Pranayama and Asanas	60 Minutes
Wednesday	Asanas and Meditation	60 Minutes
Thursday	Yoga Nidra	60 Minutes
Friday	Suryanamaskar and Relaxation	60 Minutes

3.7.1 DESCRIPTION OF YOGIC PRACTICES: (Iyengar, 1985)

SURYA NAMASKAR



Pranam Asana : Stand upright and relaxed
hands folded.

Breathing : Normal



Hasta Uthanasana : Bend head and body back
with arms raised.

Breathing : Inhale



Pada Hastanasana : Bend forward palms on the
floor Knees Locked.

Breathing : Exhale



Ashwa sanchalasana : Right foot back and left foot
forward between hands.

Breathing : Inhale.



Parvat Asana : Press palms on the floor,
raise hips at angle with the
Breathing : Exhale.



Ashtanga Namaskar : Drop knees chest and chin on
the floor, hip little up.
Breathing : Normal.



Bhujangasana : Lift the head up and bend all
the way back.
Breathing : Inhale.



Parvat Asana : Press palms on the floor,
raise hips at angle with the
Breathing : Exhale



Ashwa sanchalasana : Right foot back and left foot forward between hands.
Breathing : Inhale



Pada Hastanasana : Bend forward palms on the floor. Knees locked.
Breathing : Exhale



Hasta Uthanasana : Bend head and body back with arms raised.
Breathing : Inhale



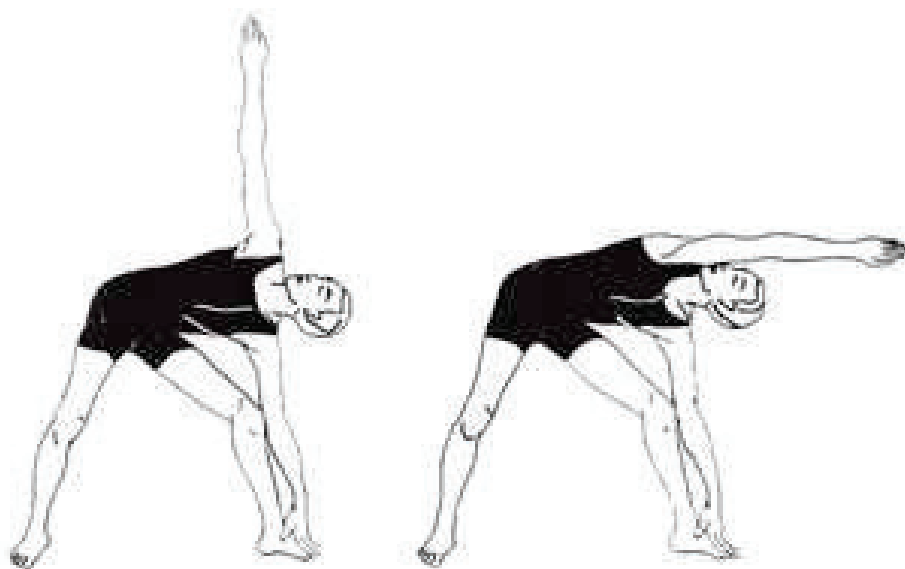
Pranam Asana : Stand upright and relaxed with hands folded.
Breathing : Normal

TRIKONASANA

This involves standing erect keeping the distance between the feet about one or one and a half feet. Hands are raised upward towards the sky, fixing the gaze on the palm. Left hand is kept down. Body is stretched to pull the right hand up and the left hand down. Without bending the legs, the body is slowly lowered towards left in such a way that the left palm touches the ground on the side of the foot. During the process of lowering, breath is exhaled. Right arm is kept close to the ear and parallel to the ground, looking all the time toward the sky.

The subject reverts to the first position inhaling the breath and stretches both hands up and down. This process is repeated with the left hand up and the right hand down.

Figure -13



CHAKRASANA

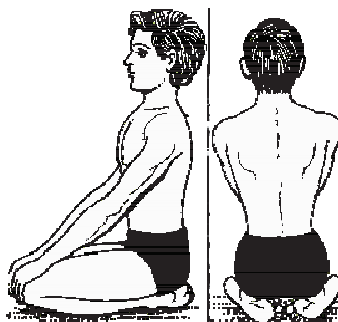
The subject stands with the feet apart to the shoulder width. Hands are raised upward. The trunk is slowly bent backward and the palms are placed on the ground.

Figure -14

**VAJRASANA**

Here the subject bends the legs and sits on the knees placing the heels under the hips. The heels should be open but the toes should be joined and the feet completely touching the ground. The spine is kept straight and the hands are placed on the knees while the arms are kept straight.

Figure -15



HALASANA

Lying on the back, the legs are raised slowly up to 90 degrees and held for a few seconds. Legs are gently lowered behind the head until the toes touch the ground. Feet are extended a little further behind the head with toes pointing outward.

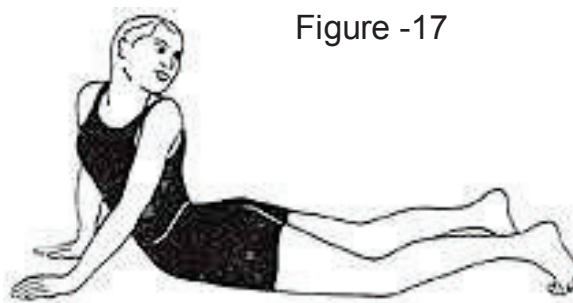
Figure -16



BHUJANGASANA

Lying in prone position, with legs straight together and chin touching the ground, the subject rests the palms on the ground below the shoulders and elbows with the soles of the feet facing up. Inhaling slowly the chin, nose, forehead, head and chest are slowly raised as the cobra raises its hood. The spine is bent as an arch and the back and lumbar regions are well stretched. In this pose elbows and hands are kept straight and close to the body. Slowly the breath is relaxed while the body assumes the previous position.

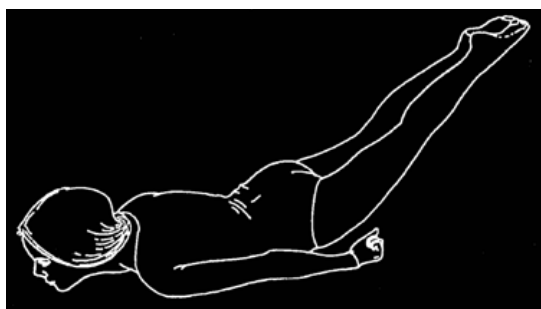
Figure -17



SALABHASANA

The subject lies on the ground with the face downward and the chin resting on the ground. Hands are placed under the thighs with the palms sticking to the thighs. The legs and the hind position of the body up to the waist are raised, while inhaling. Care should be taken neither to bend the legs nor to raise the face from the ground. The subject should remain for some time in this position before coming back slowly to the former position, exhaling the breath and taking the hands out.

Figure -18



SARVANGASANA

Lie flat on your back. Inhale deeply while raising your legs and spine until the toes point to the ceiling. The body rests on the shoulders and the back of the neck. The body is supported by the hands, which are placed on the center of the spine between the waist and the shoulder blades. Keep your spine and legs straight. Breathe slowly and deeply with the abdomen and concentrate on the thyroid gland. On a male, the thyroid gland is located behind the Adams apple. For women, it is located in the same area which is a few inches above the sternal notch (hollow of the neck where the neck joins the rest of the body.) or approximately half way up the neck from the sternal notch. Stay in this position for about two minutes. To come out of this posture, just bend your knees, curve your back and slowly return to lying on the floor while exhaling. First bend your knees, put the palms on the floor, then curving the spine, gradually unfold it the way one unrolls a carpet. When your entire back touches the floor, straighten the knees, take a deep breath and slowly lower your legs to the ground while breathing out. If you wish, you may go straight into the next posture (the 'reverse posture') instead of lying down.

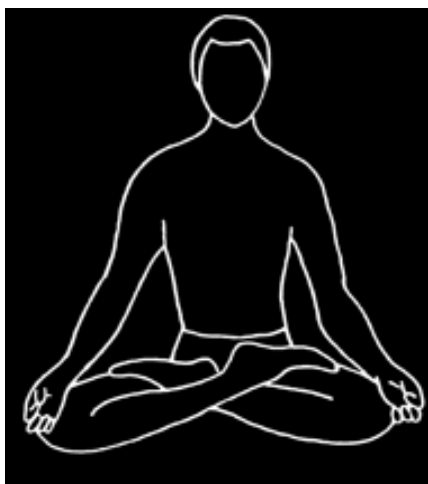
Figure -19



PADMASANA

Here the subject places his right foot on the left thigh and left foot on the right thigh with the soles of the feet upward. The hands are either placed on the lap, with palms up. Place the right hand upon the left or leave them hanging down loosely on the knees with fingertips pointing to the earth.

Figure -20

**SAVASANA**

This is a relaxing asana. One should lie on the back with a little distance between the legs and hands a little away from the body. The body should be slack. Position of the head should either be straight or tilted to any side that suits best.

Figure - 21



PATCHI MUTHUASANA

The front side of the body is called east side, while the back side is called the west side. In this Asana complete back side, i.e., the west side, right from the heels to the forehead, gets stretched and therefore, it is called 'Pashchimottanasana' posture.

Figure - 22



Position

1. After bending down, keep the heels, calves, thighs completely touching to the floor, keeping the spine straight, rest the forehead on the knees and continue smooth breathing. Try to rest the elbows on the floor
2. Since here the abdomen gets completely folded, it becomes necessary to bend only after complete exhalation
3. One should bend downward as much as one's body permits and then try to stabilize at that point, keeping the breathing smooth. Do not try to raise the knees in order to get the forehead on to the knees

4. After taking the position, relax the whole body and automatically the head, shoulder, chest will come down owing to their weight and relaxation

YOGA NIDRA

Yoga Nidra is a powerful meditative technique to relax consciously. It is a state of dynamic sleep. It is a systematic method of inducing complete physical, mental and emotional relaxation. It is a psychic sleep. It is a Raja yoga technique.

The term yoga nidra is derived from two Sanskrit words, 'Yoga' meaning 'union or one-pointed awareness' and 'nidra' which means 'sleep'. It is a deep relaxation with inner awareness. It means sleep with a trace of awareness. Yoga Nidra is formulated by Bihar school of yoga.

Guidelines:

- Yoga nidra lasts generally for 20 to 40 minutes .
- Separate techniques are available for unhealthy persons.
- Choose a quiet room.
- Learn from a tape or record.
- Do it in Shavasana; can be seated in a chair too.
- Do follow the instructions mentally.
- Be relaxed.
- Be refrain from sleep.
- Light, loose clothing should be worn.

- Do either in the morning or in the evening.
- Do it on an empty stomach.
- No pillow should be used.

Stages of Yoga Nidra (Processes)

1. Preparation (Pawanamuktasana, Suryanamaskar & Asanas)
2. Relaxation (In Shavasana –Body /OM)
3. Resolve (personal Sankalpa-Don't change)
4. Rotation of Consciousness(through different parts of the body)

(Right side, Left side, back, front, major parts)
5. Awareness of breath (nostrils to the chest) (Count breaths with 27 to 1)
6. Visualization (Symbols, Temples, Flowers, Oceans, Landscapes, Mountains etcetera).
7. Resolve (personal Sankalpa – Don't change)
8. Ending in the practice (from psychic sleep to the waking state)

Various other methods are also available.

3.7.2 DESCRIPTION OF JACOBSON PROGRESSIVE MUSCULAR RELAXATION TECHNIQUE

Table IV

Experimental Group II

Psycho-Somatic Regulative programme of Jacobson Progressive Muscular Relaxation Technique

Day	Programme	Duration
Monday	Jacobson Progressive Muscular Relaxation Technique (Sequence: Upper body to Lower body, neck and face at last.)	60 Minutes
Tuesday	Jacobson Progressive Muscular Relaxation Technique (Sequence: Lower body to Upper body, neck and face at last.)	60 Minutes
Wednesday	Jacobson Progressive Muscular Relaxation Technique (Sequence: Upper body to Lower body, neck and face at last.)	60 Minutes
Thursday	Jacobson Progressive Muscular Relaxation Technique (Sequence: Lower body to Upper body, neck and face at last.)	60 Minutes
Friday	Jacobson Progressive Muscular Relaxation Technique (Sequence: Upper body to Lower body, neck and face at last.)	60 Minutes

JACOBSON PROGRESSIVE MUSCULAR RELAXATION TECHNIQUE**PROCEDURES**

1. Close both eyes, take two deep breaths, and feel “let go”.
2. Extend both arms straight out and clench the fists... gradually increase the tension level until all the muscles in the fingers and hand are fully tight... let the arms drop naturally. Be aware of the difference between feeling “tense” and “relaxed”.
3. Extend both arms again, straight out, and tense the muscles of the lower arm and elbow... hold it, become aware of the feeling... now relax... let the arms drop naturally to the side.
4. Tense the muscles in forehead by frowning... hold it, become aware of the feeling... now relax... let all muscles in the forehead become smoother and smoother.
5. Tense the muscles in the face... grimace... hold it, become aware of the feeling... now relax.
6. Tense the muscles in the neck... hold it, become aware of the feeling... now relax.
7. Tense the muscles of the shoulders... hold it, become aware of the feeling... now relax.
8. Tense the muscles of the back, first the upper back and then the lower... hold it, become aware of the feeling... now relax.

9. Tense the muscles of the chest... hold it, become aware of the feeling... now relax.
10. Tense the muscles of the stomach... hold it, become aware of the feeling... now relax.
11. Tense the muscles of the abdomen... hold it, become aware of the feeling... now relax.
12. Tense the muscles of the upper leg – all the muscles of the thigh... hold it, become aware of the feeling... now relax.
13. Tense the muscles of the lower leg – all the muscles of the knee and calf... hold it, become aware of the feeling... now relax.
14. Tense the muscles of the feet and toes... hold it, become aware of the feeling... now relax.
15. Now concentrate on relaxing all the muscles of the body. Become aware of any areas that might still be tense in any way, and relax them. Maintain this state of total muscle relaxation for at least two or three minutes.
16. Open the eyes, stretch, and feel refresh.

3.7.3 DESCRIPTION OF PHYSICAL EXERCISES

Table V

Experimental Group III

Psycho-Somatic Regulative programme of Physical Exercise

Day	Programme	Duration
Mon Day	Walking	60 Minutes
Tuesday	Jogging	60 Minutes
Wednesday	Baithaks	60 Minutes
Thursday	Aerobics	60 Minutes
Friday	Dands	60 Minutes

3.7.4 WALKING PROGRAMME

The subjects were ask to walk following timings.

- | | |
|---|------------|
| 1. Assembly and Instructions | 5 Minutes |
| 2. Warm up | 10 Minutes |
| 3. Walking | 30 Minutes |
| 4. Cool Down | 10 Minutes |
| 5. Assembly, Instructions and Dismissal | 5 Minutes |

3.7.5 JOGGING PROGRAMME

The subjects were ask to walk following timings.

1. Assembly and Instructions	5 Minutes
2. Warm up	10 Minutes
3. Jogging	30 Minutes
4. Cool Down	10 Minutes
5. Assembly, Instructions and Dismissal	5 Minutes

3.7.6 DANDS AND BAITHAKS

The most features of Dands and Baithaks is that they have done rhythmically and at steady phase. One can do and practice as many as to improve strength, focus and mental clarity by increase in numbers. Dands and Baithaks are two different exercises but together constitute the core wrestling Vyayam regimen. Dands are Jack Knifing pushups and Baithaks comparable to western style knee bend. One start a baithak from a standing position with feet set to 45 angles and heels about 15cm apart. One's eyes should be fixed on a point about 4 meters forward. Among 2000 to 3000 Baithaks a day by champions helps to attain personal strength, prediction and specific goal Dands are similar to certain aspect of Suryanamaskar. Dands start by facing down position (prone) with feet placed together and palm flat on ground directly below the shoulder half a meter. There are many, about 5000 dands are practiced in exceptional by wrestlers. In most sports Dands

are practiced after the morning practice session. Some practice both Dands and Baithaks in evenings.

Dands and Baithaks make the muscle of the body. So incredibly strong that the wrestling appears divine. Dands and Baithaks are the minor in which auro of wrestling reflected. They are the two flowers which are offered to the “wrestlers God”. Dands and Baithaks are two sacrifices made to Goddess of wrestling. (Alter, 1974).

3.7.7 BAITHAKS EXERCISE:

Starting position: Standing

Count 1 : Arms bend and fingers placed on shoulders –full knee bend – heels raised.

Count 2 : Come to standing position

Same Baithak with forward and backward jumps.

Same Baithak with backward jumps.

Same Baithak with jump – right turn.

Same Baithak with jump – left turn.

Variations : Position of the hands on hip.

PUNJA BAITHAKS (HEELS RAISING BAITHAK)

- Count 1** : Arms forward raise and breathe in.
- Count 2** : Hold the breath – half knee bend – heels raise.
- Count 3** : Legs straight – hold the breath.
- Count 4** : Breath out – standing position.

CHAIR BAITHAK

- Count 1** : Left leg sideward step – half knee bend – hands forward raise and finger clasped.
- Count 2** : Pivot on right leg – move leg and body backward to 90° without raising the body.
- Count 3** : Come to count 1 position.
- Count 4** : Original standing position.

STOOPING BAITHAK**Starting position: Standing**

- Count 1** : Bend forward – touch the ground with palm – arms with shoulder width – bend the knees and knees between arms.
- Count 2** : Straighten the knee.
- Count 3** : Bend the knees – left arms between knees.

- Count 4** : Straighten the knees (same as count 2).
- Count 5** : Bend the knees and the right arms between knees.
- Count 6** : Straighten the knees.
- Count 7** : Same as count 1.
- Count 8** : Come to starting positions.

HANUMAN BAITHAK (WITH FULL KNEE BEND)

- Count 1** : Full squat with left leg forward – left arm bend near the fore head – right arm bend backward.
- Count 2** : With jump right leg and arm forward – left leg and arm backward.
- Count 3, 4, 5, 6, 7** : Repeat.
- Count 8** : Starting position (Same baithak with right leg forward in count 1)

KNEELING BAITHAK (NAMASKAR BAITHAK)

NAMASKAR BAITHAKS

- Count 1** : Squat and kneels with knees 12 inches apart, arms on ground in front of the knees.
- Count 2** : Flex arms, touch the ground with fore head.

Count 3 : Same as count 1.

Count 4 : Position

KNEELING BAITHAK WITH SINGLE ARM MOVEMENT

Count 1 : Squat and kneel with knees 12 inches apart, arms on ground in front of the knees.

Count 2 : Raise left arm, flex the elbow bring the arm to the shoulder level with palm front.

Count 3 : same as count 1.

Count 4 : Position.

KNEELING BAITHAKS WITH BOTH ARMS MOVEMENTS

Count 1 : Squat and kneels with knees 12 inches apart arms on ground in front of the knees.

Count 2 : Raise both arms to the shoulder level with flexed elbows, palm facing front.

Count 3 : Same as count 1.

Count 4 : Position.

SARAK BAITHAK**Starting position: Attention**

Count 1 : Jump forward about one foot, swing the arms forward and bend at elbows, first close to the shoulder , full knee bend, heels raise and body erect.

Count 2 : Jump backward to the staring position.

Variation I :

Count 1 : Jump forward about one foot, swing the arms forward and bend at elbows, first close to the shoulder, full knee bend, heels raise and body erect.

Count 2 : With full knee bend, step left foot back

Count 3 : Bring the right foot to the side of the left.

Count 4 : Position.

Variation II :

Count 1 : Jump forward about one foot, swing the arms forward and bend at elbows, close to the shoulder, full knee bend, heels raise and body erect.

Count 2 : Straighten the knee, step left foot backward, followed by the right

Count 3 : Stepping right foot forward, bring left foot to the side of the right, have a full kneebend.

Count 4 : Jump backward and position.

PAVITRA BAITHAK (LUNGING BAITHAK)

Count 1 : Inhale and raise the heels and have a quick full knee bend.

Count 2 : Straighten the knee, take left foot back and lunge on the right.

Count 3 : Pressing trunk backward, raise the arms sideward, upward and bring them forward in front of the chest.

Count 4 : Reversing the movement of the arms and trunk, bring the left foot forward to the side of the right foot, exhale and return to starting position (Adhicha pillai et al., 2006).

3.7.8 DANDS EXERCISES:

ORDINARY DAND

In all Dands – starting position – standing position

Count 1 : Squat – place the hands on the ground with shoulder width.

Count 2 : From squat position shoot the whole body backward as far as possible – whole weight on the shoulder joint.

Count 3 : Drag the body forward along the ground – head up – arch back.

- Count 4** : Bring the body as in count 2.
- Count 5** : As in count 3
- Count 6** : As in count 2
- Count 7** : Jump forward – come to the position as in count 1.
- Count 8** : Standing position

REVERSE DIP DAND

- Count 1** : Squat – Hands on the ground with shoulder with
- Count 2** : Shoot the legs backward and bring the body in inverted 'V' position. Legs slightly apart – whole sole touch the ground.
- Count 3** : Drag the body forward along the ground - arch back – head up.
- Count 4** : Drag the body backward along the ground without bend the knees – bring the body as in count 2
- Count 5** : As in count 3
- Count 6** : As in count 4
- Count 7** : Squat position as in count 1
- Count 8** : Standing position

SCORPION DAND

- Count 1** : Squat – hands on the ground with shoulder width
- Count 2** : Shoot both legs backward – body close to the ground – same time bend the left leg like the tail of the scorpion.
- Count 3** : Whole weight on the shoulder – left leg downward and raise the right leg like the tail of the scorpion simultaneously.
- Count 4** : Change to left leg
- Count 5** : Change to right leg
- Count 6** : Both legs on the ground – body arch back
- Count 7** : Squat position as in count 1
- Count 8** : Standing position

FROG DANG

- Count 1** : Squat with both hands on the ground with shoulder width.
- Count 2** : From the squat position shift the whole body back with jump – whole weight of the body on the shoulder joint.
- Count 3** : From count 2 position jump forward – land on the ground with flexed elbow joint and legs at back straight – body close to the ground.
- Count 4** : As in count 2
- Count 5** : As in count 3

Count 6 : As in count 4

Count 7 : Jump forward – Squat position as in count 1.

Count 8 : Standing position

FROG DAND WITH CLAP

Count 1 : Squat with both hands on the ground with shoulder width

Count 2 : From the squat position shift the whole body back with jump – whole weight of the body on the shoulder joint.

Count 3 : While jumping forward clap the hand and land on the ground as in count 3 in frog dand.

Count 4 : As in count 2.

Count 5 : As in count 3 (Clapping)

Count 6 : Jump forward – Squat position as in count 1

Count 7 : Standing position. (Adhicha pillai et al., 2006)

3.7.9 AEROBICS EXERCISES

Table VI
Name of Aerobic Exercises, Number of Counts and Number of Sets

S. No.	Name of Exercise	No. of Counts	No. of Sets
1	Touch Out	32	4
2	Side to Side	32	4
3	Double Side to Side	32	4
4	Grapevine	32	4
5	Cross Over Step	32	4
6	Jump on the Spot	32	4
7	Knee Curl	32	4
8	Front Kick	32	4
9	Knee and Arm Lift	32	4
10	Side Kick	32	4

Thus, the aerobic training sessions were conducted in the following timings.

1. Assembly and Instructions	5 Minutes
2. Warm up	10 Minutes
3. Aerobic Exercises	30 Minutes
4. Cool Down	10 Minutes
5. Assembly, Instructions and Dismissal	5 Minutes

All the subjects performed the aerobic exercises after proper warming up.

Warm – Up Segment

A ten minutes warm up session consisting of 200 meters jogging, a balanced combination of static stretches, smoothly controlled rhythmic calisthenics and limbering exercises were performed by the subjects prior to the training sessions. (Soligard, et al. 2008).

Aerobics Exercise Segment

After the warm up, aerobics exercises were given for 30 minutes, along with the music, which was at 128 beats per minute. To start with the exercises, the subject stood with both feet at shoulder width distance and the arms were kept on either side of the body in a relaxed position, the following aerobics exercises comprising of one count, two counts, four counts, eight counts and sixteen counts were continued.

I. Touch Out

1. The left leg was stretched two feet to the left side and touched the ground, simultaneously both the arms were stretched at shoulder level.
2. The left leg arms were brought back to the starting position counts 3 and 4 were repetition of 1 and 2 with right leg and arms.

Number of Sets: Eight sets were performed continuously on left and right side alternatively for a total of 32 counts.

II. Side to Side

1. The left leg was placed one step to the left and simultaneously both the hands were placed on the hip.
2. With the sideward movement, the right leg was placed near the left leg.
3. The right leg was brought back to the starting position.
4. The left leg was brought back to the starting position.

Numbers of sets: Four sets were performed continuously on left and right side alternatively for total of 32 counts.

III. Double side to Side

1. The left leg was placed one step to the left and simultaneously both the hands were placed on the hip.
2. With the sideward movement the right leg was placed near the left leg simultaneously the hands were brought back to the position.
Count 4 was repetition of count 1 further towards the left side.
Count 5 to 8 were repetitions of 1 to 4 towards the right side to return to the starting position.
The same procedure was followed on the right side for counts 9 to 16.

IV. Grapevine

1. The left was placed one step to the left and simultaneously both the hands were placed on the hip.
2. The right leg was placed behind the left leg with the heels raised.
3. The right leg was brought back to the starting position.
4. The left leg was brought back to the starting position. The same procedure was followed on the right side for counts 5 to 8.

Number of Sets: Four sets were performed continuously on left and right side alternatively for a total of 32 counts.

V. Cross Over Step

1. The subject raised the left heel up and swung the right arm forwards and left arm backward simultaneously.
2. The above step was repeated with right leg and arms.
3. Stepped sideways with a cross over step with the right leg the trunk downwards towards left side.
4. The subject returned to the starting position
Count 5 to 8 were repetitions of 1 to 4 with left leg and left arm.

Number of Sets: Four sets were performed continuously on left and right side alternatively for a total of 32 counts.

VI. Jump on the Spot

1. The subject jumper slightly upwards simultaneously both arms were stretched forward and upward up to either side of the head.
2. The subject performed one more additional jump.

3. The legs were brought back to the starting position simultaneously with a sideward and downward movement of the arms up to the shoulder level.
4. The arms were brought back to the starting position.

Number of sets: Eight sets were performed continuously for a total of 32 counts.

VII. Knee Curl

1. The left leg placed one step to the left side and simultaneously both the hands were placed on the hip.
2. The right leg was lifted diagonally towards left side with the knee flexed.
3. The right leg was brought back to the starting position.
4. The left leg and arms were brought back to the starting position.

The above steps were repeated on the right side from counts 5 to 8.

Number of Sets: Four sets were repeated continuously on left and right side alternatively for a total of 32 counts.

VIII. Front Kick

1. With a jump the left thigh was raised to hip level and simultaneously both the hands were placed on the hip.
2. After landing, again with a jump the left leg was kicked forwards.
3. After landing, again with a jump the left leg was brought back to the count 1 position.
4. The left and arms brought back to the starting position.

Counts 5 to 8 were repetitions of 1 to 4 on the right leg.

Number of Sets: Four sets were repeated continuously on left and right side alternatively for a total of 32 counts.

IX. Knee and Arm Lift

1. The left foot was placed one step to the front and simultaneously the left arm flexed at elbows with clenched hand was raised side wards at right angle to the shoulder level. The right hand was placed on the hip.
2. The right knee was lifted forward at right angle to the hip and flexed left arm was moved forward from the sideward position.
3. The right foot and left arm were brought back to the starting position.
4. The left foot and arms were brought back to the starting position.

The above procedure was repeated with the other leg and arm for counts 5 to 8.

Number of Sets: Four sets were repeated continuously on left and right side alternatively for a total of 32 counts.

X. Side Kick

1. The left thigh was lifted forwards to hip level with a jump and simultaneously both the hands were placed on the hip.
2. After landing, again with jump the left leg was kicked sideways.
3. Again with a jump, the left leg was brought back to the count 1 positions.
4. The left leg and arms were brought back to the starting position.
Counts 5 to 8 were repetitions of 1 to 4 on the right leg.

Number of Sets: Four sets were repeated continuously on left and right side alternatively for a total of 32 counts.

Cool Down Segment

The aerobics sessions concluded with continued light aerobics activities such as walking, standing leg kicks and static stretches to prevent pooling of blood in the lower extremities immediately after the endurance phase and lower the heart rate gradually towards normal to promote faster removal of metabolic waste products from the muscles. Avoided bent-over stretched for long periods to avoid dizziness (Soligard T, et al. 2008)

Table III shows the training schedule for Floor aerobics group consisting of name of exercises, number of counts and number of sets.

3.8 MEASUREMENT OF PSYCHOLOGICAL VARIABLES

Personality Development Index consists of 85 items, which were ranged on the basis of five point scale. They are 1.Strongly disagree 2. Disagree, 3.Uncertain 4. Agree and 5. Strongly agree.

The items in the personality development index are classified as follows:

Table VII

Showing the Factors and Statement Assessing Selected Psychological Variables

S. No.	Psychological Variables	Statements
1	Social Concern	1, 11, 21, 31, 41, 51, 61 and 67
2	Emotional Adjustment	2, 12, 22, 32, 42, 52, 62, 68, 71, 74, 76, 78, 80, 82, 84 and 85
3	Assertiveness	3, 13, 23, 33, 43, 53 and 63
4	Value and Culture	4, 14, 24, 34, 44, 65, 69, 72, 75, 79 and 81
5	Leadership	5, 15, 25, 35, 45 and 55
6	Communication Skill	6, 16, 26, 36, 45 and 56
7	Self Awareness	7, 17, 27, 37, 47 and 57
8	Self Confidence	8, 18, 28, 38, 48 and 58
9	Interpersonal Relationship	9, 19, 29, 39, 49, 59 and 65
10	Stress Management	10, 20, 30, 40, 50, 60, 66, 70, 73, 77 and 83

Procedure

For the purpose of this study, the researcher intended to measure selected psychological variables Self confidence, Emotional Adjustment, Assertiveness, Inter Personal Relationship and Stress management. The research administered the entire questionnaire consisting of 85 statements before the experiment among all the three groups, which formed the pre test scores of the selected psychological variables. After the experimental period the same questionnaire was administered and the scores collected formed post test scores.

Scoring

The following score key was used for assessing the psychological variables:

Table VIII

Score key was Used for Assessing the Psychological Variables

Response	Score
Strongly Disagree	1
Disagree	2
Uncertain	3
Agree	4
Strongly Agree	5

Reverse scoring were made for the following statements:

2, 4, 11, 12, 15, 17, 21, 24, 32, 44, 45, 47, 52, 55, 62, 69, 71, 72, 74, 76, 79, 80, 81, 82, 84 and 85

Thus, the scoring for the selected psychological variables were made as detailed in Table IX:

Table IX

Showing the Psychological variables, Statement Number and the Minimum and maximum Score

S. No.	Psychological Variables	Statements	No. of Statements	Minimum Score	Maximum Score
1	Emotional Adjustment	2, 12, 22, 32, 42, 52, 62, 68, 71, 74, 76, 78, 80, 82, 84 and 85	16	16	80
2	Assertiveness	3, 13, 26, 3, 33, 43, 53 and 63	8	8	40
3	Self Confidence	8, 18, 28, 38, 48 and 58	6	6	30
4	Interpersonal Relationship	9, 19, 29, 39, 49, 59 and 65	7	7	35
5	Stress Management	10, 20, 30, 40, 50, 60, 66, 70, 73, 77 and 83	11	11	55

3.8.1 MEASUREMENT OF PHYSIOLOGICAL VARIABLES

VITAL CAPACITY

Purpose:

Determination of vital capacity

Equipment

Spiro meter, chair and nose clips.

Procedure

The vital capacity of the subject was determined by the Spiro meter in sitting position. The subject was allowed to inspire the maximum amount of air voluntarily and then she was asked to blow into the dry Spiro meter to the maximum extent. While taking the test the nose of the subject was clipped using a nose clip.

Scoring

The vital capacity of the subject was obtained from the movement of circular volume indicator which was set at '0' before the vital capacity measure was taken. The result was recorded in milliliter. (Mathew, 1988).

RESTING HEART RATE

Purpose

To measure the resting heart rate of each subject per minute

Equipments

Digital Heart Rate Measuring Machine, Model No. EW 243, manufactured by National Company, Japan

Procedure

The pulse rate of all the subjects were recorded in a sitting position, in the morning between 5.30 a.m and 6.00 a.m. Before taking heart rate the subjects were asked to relax for about 30 minutes.

Then the subjects were instructed to sit in a back supported chair and maintain in a slight incline position and placed his left hand on the table. Next the researcher was collected Heart Rate by using Digital Heart Rate measuring machine which was placed in the chest level on a table. In this way the researcher was measured the heart rate of the subject.

Scoring

The number of pulse beats per minute were recorded as the scores.
(Robergs R and Landwehr R, 2002)

MEAN ARTERIAL BLOOD PRESSURE

Purpose:

The purpose of this test was to measure mean arterial blood pressure at rest.

Equipment:

Sphygmomanometer and Stethoscope.

Procedure:

A sphygmomanometer and a stethoscope were used to measure blood pressure (systolic and diastolic). The subjects were asked to be in sitting position throughout study.

The left upper arm of the subjects was encircled by an inflatable rubber bag which was rapidly raised approximately to 200mmHg. Which was sufficient to completely obliterate the brachial artery so that no blood comes through and the radial pulse disappeared. The pressure was then lowered to a point where the pulse could be felt by using a stethoscope, pulsating of the brachial artery at the bend of the dial was considered to be the systolic pressure.

The pressure on the brachial artery was then gradually reduced until the arterial rate beats could be distinctly heard and particular point at which the sound disappeared was taken as the diastolic pressure.

The these two measures put into the calculation, that is, mean arterial blood pressure, using the formula as suggested by Fox and Mathews (1981).

BREATH HOLDING TIME

Purpose

The purpose of this test was to measure the breath holding time.

Equipments

For recording the breath holding time, a stop watch ($1/10^{\text{th}}$ of second) and nose clip were used.

Procedure

The subject was instructed to stand at ease and to inhale deeply after which he holds his breath for a length of time possible by him. A nose clip was placed on nose to avoid letting the air through nostrils. The duration from the time of holding his breath until the movement he let air out was clocked by using the stop watch to the nearest on tenth of a second as breath holding time. The co-operation of the subject to let out the air by opening the mouth was sought to clock the exact breath holding time.

Scoring

The time is recorded in seconds and the beset of two trials were recorded (Mathew, 1988).

RESPIRATORY RATE

Purpose

The purpose of this test was to measure the number of breaths per minute

Equipment

Bio-monitor

Procedure

The respiratory rate of the subjects were monitored through the respiratory rate of the Bio-monitor. The temperature variation near nasal region measures with the help of semi – conductor thermal sensor.

The investigator inserted the thermal sensor into the nostril, slightly inside the entrance of the nose. As the subject breathed, the variation in the temperature of the inhaled external air and the exhaled air was sensed and processed to indicated respiratory rate. Then the investigator depressed the push button switch **RESP**. The rhythm indicator **LED** and electronic beeper was flashed/beeped with every respiration cycle. The respiration rate was indicated on the digital meter. The accuracy of the equipment was +/- 3 of percentage of reading.

Scoring

Number of breaths per minute was recorded. (Kamrul, 2008).

STATISTICAL PROCEDURE

The following statistical techniques were used to find out the effect of deferent packages of psycho-somatic regulative programmes on selected psychological and physiological variables among engineering college women.

Analysis of co-variance statistical technique was used to test the adjusted post test mean differences among the experimental groups. If the adjusted post – test result was significant, the Scheffe's post hoc test was used to determine the significance of the paired mean differences (Thirumalaisamy, 1997).

The methodology adopted for this research is presented through a flow chart in Figure 23.

Figure 23
FLOW CHART SHOWING THE METHODOLOGY ADOPTED IN THIS STUDY

