CHAPTER III

METHODOLOGY

Research methodology involves the systematic procedure by which the research starts from the initial identification of the problem to its final conclusions. The role of the methodology is to carry on the research work in a scientific and valid manner.

In this chapter, procedures and methods were applied in selection of subjects, selection of variables, experimental design, pilot study, criterion measures, reliability of the data, reliability of instruments, tester's reliability, subject reliability, orientation to the subjects, training programme, training schedule, selection of tests, administration of tests, collection of data and statistical procedure followed in this study.

3.1 SELECTION OF THE SUBJECTS

To achieve the purpose of this random group experimental study ninety subject were randomly selected from ninety women football players were selected randomly from the affiliated colleges of Madurai Kamaraj University, Madurai, Tamil Nadu. The players' age ranged between 17 and 25 years. They were randomly divided into three equal groups. Yogic Practices group, tai-chi training group were considered as two experimental groups and the other group was control group. All the subjects were healthy and physically fit. The nature and importance of the study was explained to the subjects and subjects expressed their willingness to serve as subjects in this study. The study was formulated as pre post test pre experimental design.

3.2 SELECTION OF VARIABLES

The research scholar reviewed the various scientific literatures pertaining to the Yogic Practices and tai-chi training on selected physiological, bio-chemical variables, psychological and playing abilities from books, journals, periodicals, magazines and research papers and also players' nature and their problems. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected dependent variables.

3.2.1 DEPENDENT VARIABLES

Psychosocial well-being is essential to a person's quality of life. For all individuals, mental health is as vital a strand of life as their physical and social health. Mental health is largely reflected by one's psychosocial well-being such as levels of depression, anxiety, stress and life dissatisfaction, which may impact negatively on one's capacity to live a full and productive life (**Wang, et al., 2009**). Therefore, the improvement of mental wellness is critical to individuals, communities and societies.

Hence, the following dependent variables were selected and are presented below.

1. PHYSIOLOGICAL VARIABLES

i. Vital Capacity

ii. Resting Pulse Rate

iii. Breathe Holding Time

2. BIO-CHEMICAL VARIABLES

i. Blood Glucose

ii. Total cholesterol (TC)

iii Triglycerides (TGL)

3. Psychological Variables

i. Anxiety

ii. Self-esteem

iii. Achievement Motivation

4. Playing Ability

i. Dribbling

ii. Kicking

iii. Shooting

3.2. 2. INDEPENDENT VARIABLES

Hence, the following Independent variables were selected and are presented below.

i. Yogic Practices.

ii. Tai-Chi Training

Yoga is becoming more and more popular. Research has shown that it has numerous health benefits. Using yoga for stress release, appeals to people from all over the world. At Evolve we believe that improving just one's physical health is not

quite enough. One also needs to improve one's mental health and change one's lifestyle permanently with a different psychological framework. The ancient Indian science of yoga teaches us how to keep both our body and mind in great shape. If one is physically strong and has big muscles, but one is mentally weak, then what is the use of having those muscles. If one is training to have a six-pack, but one doesn't have good bowel movements, what is the use of having that six-pack. Yoga is an amazing way of maintaining a sense of total well-being in an increasingly stressful world. Yoga can benefit one's life on an external level, but most importantly, it will provide one with an internal anchor of calm. One will feel more confident, balanced and in tune with nature, which will help one to face life's many challenges (**Rohn and Robbin, Sep, 2012**).

Originally developed as a martial art, the movements of Tai Chi were quickly recognized as being beneficial to the body. The major emphasis of Tai Chi today is on its health benefits, although it may still be used as a system of self-defense after years of training and practice. To promote health, Tai Chi or Chi Gong is done in a slow and relaxed manner, with great emphasis on posture and balance. The exercise requires a high degree of concentration, with the mind free of distractions. Breathing is natural, sometimes involving abdominal respiration, and its performance is in rhythmic harmony with body movements. One could say that one reason one study Tai Chi is to help one's Chi flow smoothly. In our Tai Chi and Chi Gong classes players concentrate on breathing and fluidity of form. During the exercise all outside thoughts are cleared and only the task at hand is deemed important. It is for this reason that at Evolve Personal Health Institute Tai Chi is now highly regarded for lowering one's cortical levels by relieving stress and tension. (**Rohn and Robbin, Sep, 2012**).

In the sporting circle it has been acknowledged that tai chi is suitable for both men and woman, old or young, weak or strong, and those suffering from chronic diseases due to the softness, slowness, coherence and harmony of the exercise. Evidence shows that the prolonged and conscientious practice of tai chi significantly improves one health. Both the strength of the bones and muscles and the functions of metabolism, respiratory and cardio-vascular systems are better for those who exercise tai chi than for those who do not, according to a survey in an aged group. Their X-ray film study shows only mild degeneration and hyperplasia of the bones and spine, and most of them walk vigorously without bending the back of the knee. Their mean

blood pressure is 20mm Hg. Lower than those of the control group, with lower incidence of arteriosclerosis. An exercise loading test made by performing within one minute 15 trips of up and down two steps also showed better functions of the heart. Tai chi is quite distinct from such strenuous and energetic sports as long-distance running, ball games, swimming and others. The latter are called dynamic physical exercise, which depends on strenuous activity of the muscles and greatly increasing the oxygen demand of the body. This arouses a series of physiological responses such as panting, quickening of heart rate and raising blood pressure, which are caused passively by adaptation and relaxations mechanisms of the body through the action of the vegetative nerve system. Apparently, such exercises are hazardous to those who are aged or in poor health because of the decreased ability to adapt, especially when the exercise is done excessively. The characteristic features in practicing tai chi are stillness, lightness, slowness, relaxation of the muscles of the whole body, and more importantly use of the mind and not the force. The practitioner must be fully conscious of all the movements, that is all the movements are always controlled by the mind. By raising the physiological responses from passivity, the extent and quantity of the exercise can be adjusted according to ones demand. This is the reason why tai chi as a health exercise can be taken by both the aged and weak without harmful side effects ***(http://kungfucenterofoldsmar.com/reviews/wu-style-tai-chi-chuan/tai-chi-health-exercise/).***

Many Tai Chi intervention studies have demonstrated health benefits in older adults. However, it remains unclear which particular groups of elderly individuals are most likely to benefit from Tai Chi. The effectiveness of Tai Chi as measured in experimental studies is often declared on the basis of the observed significant mean difference between experimental and control groups on targeted outcomes of interest. This is because, with few exceptions, data from Tai Chi studies have been analyzed using the repeated-measures, analysis-of-variance model or some variation of it. However, this analytic approach is overly restrictive because it focuses primarily on the significance of group mean differences, with the variability around the means constituting error. The magnitude of the variability in the experimental and control group means is of special interest to researchers conducting randomized control trials because it holds the key to identifying individual differences in response to targeted outcomes of interest (**Li., et al., 2002**).

Increasing amounts of scientific evidence suggest that Tai-Chi (TC) is related to improvements in mental health, psychosocial well-being, stress reduction, and self-reported sleep duration. These benefits have been reported across a range of populations including children, healthy young and old adults and patient population such as those individuals with Parkinson's, cardiovascular disease, and AIDS. Other investigators have cast doubt on these findings by reporting little or no psychological benefits resulting from practicing TC (**Zhang, et al., 2012).**

Heart disease is a chronic condition needing lifetime secondary prevention measures to decrease morbidity and mortality, and to improve quality of life. Cardiac rehabilitation exercise training, one aspect of cardiac recovery, traditionally includes some form of aerobic fitness and, more recently, muscle strength training to improve exercise tolerance. Tai chi, widely practiced in China for centuries, is a popular form of exercise among older Chinese persons associated with enhanced well-being and health among traditional Chinese practitioners. Recent research has reported improvement in cardio respiratory function, balance and postural stability, fall prevention, and stress reduction. A review of the literature suggests potential benefits from tai chi exercise performed as an adjunct to cardiac rehabilitation exercise training. Tai chi is cost-effective and facilitates a lifestyle of health-related behavior practices (**Taylor-Piliae, 2003**).

Yogic practice and tai-Chi training is a valuable method by which to enhance or maintain a healthy state of physiological, bio-chemical and psychological functioning for a variety of populations. Based on the above facts the following training methods were selected for the present study.

(i) Yogic Practices.

(ii) Tai-chi Training.

(iii) Control group - No training

No doubt these variables are very much important to the performance of the football players very particularly women.

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 =90) were randomly assigned to three equal groups of thirty women football players each. The groups were assigned as experimental group I, II and control group respectively. Pretest was conducted for all the subjects on selected physiological, Bio-Chemical, psychological variables and playing ability

such as Vital Capacity, Resting Pulse Rate, Breathe holding time, Blood Glucose, Total Cholesterol, Triglycerides, Anxiety, Self-esteem, Achievement Motivation, Dribbling, Kicking and Shooting. The experimental groups participated in their respective training programme for a period of 12 weeks with six days per week. The post test was conducted on the above said dependent variables after a period of 12 weeks in the respective treatments. The training Programs were scheduled one hour at maximum daily in the morning.

The scholar himself conducted the experimented session. The scholar has enough knowledge on the independent variables to carry out the experimentations. Demonstrations by the scholar on Tai-Chi training was done and followed by the subject at every session of the entire experimental period.

3.4 PILOT STUDY

A pilot study was conducted to assess the capacity and initial strength of all the subjects in order to fix the load and exercise. For this, 12 women football players were selected at random and divided into two groups of six each, in which group I underwent yogic practice and group II performed tai-chi training under the supervision of the investigator. Based on the response of the subjects in the pilot study, the training schedule was designed and presented in the table III & IV**.** The individual differences were considered, while constructing the training programmes. The basic principles of sports training namely progression of load, over load and specificity were followed.

3.5 CRITERION MEASURESANDTEST

After reviewing the available literature, the following standardized tests were selected and used to collect the relevant data on the selected dependent variables and they are presented in table I.

TABLE I

VARIABLES SELECTED AND TESTS

S. NO	Variables	Test/ Tools Administered	Unit of Measurement
Physiological			
1	Vital capacity	Spiro meter	In milliliters
2	Resting pulse rate	Radial Pulse	In beats/minute
3	Breathe Holding Time	Calibrated stop time	In Seconds
Bio-Chemical			
4	Blood glucose	Computerized semi auto analyzer RANDOX	In mg/dL
5	Total Cholesterol	Computerized semi auto analyzer RANDOX	In mg/dL
6	Triglycerides	Computerized semi auto analyzer RANDOX	In mg/dL
Psychological			
7	Anxiety	SCAT questionnaire	In Points
8	Self-Esteem	Rosenberg's Self-Esteem Scale	In Points
9	Achievement Motivation	Dr.M.L.Kamalesh SAMT questionnaire	In Points
Playing Ability			
10	Dribbling	Mor-Christian Soccer Dribble test	In Seconds
11	Kicking	Borleske touch football punt for distance test	In Meters
12	Shooting	Shooting Skill Test	In Points

3.6 RELIABILITY OF DATA

In order to establish the reliability of the data, the investigator has established instrument reliability, tester reliability and subject reliability.

3.7 RELIABILITY OF INSTRUMENTS

For training purpose the equipment's like the measuring tape, stop watch, Spiro meter, and bench used in the study were obtained from standard suppliers and which are properly calibrated. The instruments available at the department of physical education were used in the present study. Therefore, it is considered as reliable, valid and accurate. All the instruments were in good condition and workable.

3.8 TESTER'S RELIABILITY

To measure uniformity and reliability of the testing technique, the investigator had a number of practice session in the testing procedure with the guidance of their teacher. The investigator has done all the experimental parameters with the assistance of their teacher and laboratory experts.

3.9 SUBJECT'S RELIABILITY

Three months before the commencement of the pilot study, the reliability of the data was established by using 10 subjects at random. To ensure reliability, test and re-test method was executed. In between the test and retest, one-day rest was given to all the subjects. The same testing personnel by using the same equipments under identical conditions tested all the variables selected in the present investigation twice on the same subjects. The intra class co-efficient of correlation was used to find out the reliability of the data and the results are given in table II.

TABLE II

INTRA CLASS CO-EFFICIENT OF CORRELATION ON SELECTED VARIABLES

S. NO	Variables	'R' Value
1	Vital capacity	0.97*
2	Resting pulse rate	0.91*
3	Breathe Holding Time	0.91*
4	Blood glucose	0.96*
5	Total Cholesterol	0.98*
6	Triglycerides	0.98
7	Anxiety	0.89*
8	Self-Esteem	0.83*
9	Achievement Motivation	0.89*
10	Dribbling	0.91*
11	Kicking	0.92*
12	Shooting	0.91*

***Significant at 0.01 level. (Table value required for significance at 0.01 level of confidence is 0.77)**

Since the obtained 'R' values were much higher than the required value, the data were accepted as reliable in terms of instrument, tester and the subjects.

3.10. ORIENTATION TO THE SUBJECTS

Before the collection of data, the subjects were oriented about the purpose of the study that was the effect of selected physiological, bio-chemical, psychological variables and playing abilities. The scholar has explained the training methods and its procedures, the training schedule and utility. Procedure of the training was instructed to the subjects.

3.11. TRAINING PROGRAMME

During the training period the experimental group-I underwent Yogic Practices programme for weekly six days, Experimental Group –II underwent Tai-Chi training for weekly six days at 6.30 a.m. to 7.30 a.m. Experimental treatment was restricted to 12 weeks.

3.11.1. TRAINING SCHEDULE

TABLE – III

TRAINING SCHEDULE FORYOGIC PRACTICES

Sl.No	NAME OF THE ASANAS	Repetition			Rest between Asanas	Rest between sets	Frequency per week
		First Four Weeks (40 min)	5th to 8th week (50 min)	9th to 12th week (60 min)			
1.	Loosening Exercises	1	1	1	10 sec	30 sec	6 days
2.	Surya Namaskara	1	2	3	10 sec	30 sec	6 days
3.	Vrkshasana	1	2	3	10 sec	30 sec	6 days
4.	Trikonasana	1	2	3	10 sec	30 sec	6 days
5.	Padmasana	1	2	3	10 sec	30 sec	6 days
6.	Paschimottanasana	1	2	3	10 sec	30 sec	6 days
7.	Ardha Matsyendrasana	1	2	3	10 sec	30 sec	6 days
8.	Upavistha konasana	1	2	3	10 sec	30 sec	6 days
9.	Supta Virasana	1	2	3	10 sec	30 sec	6 days
10.	Krounchasana	1	2	3	10 sec	30 sec	6 days
11.	Dhanurasana	1	2	3	10 sec	30 sec	6 days
12.	Matsyasana	1	2	3	10 sec	30 sec	6 days
13.	Sarvangasana	1	2	3	10 sec	30 sec	6 days
14.	Halasana	1	2	3	10 sec	30 sec	6 days
15.	Shavasana	1	2	3	10 sec	30 sec	6 days
Pranayama							
16.	Bhastrika Pranayama	1	2	3	10 sec	30 sec	6 days
17.	Nadisodhana Pranayama	1	2	3	10 sec	30 sec	6 days
18.	Relaxation						6 days

TABLE – IV

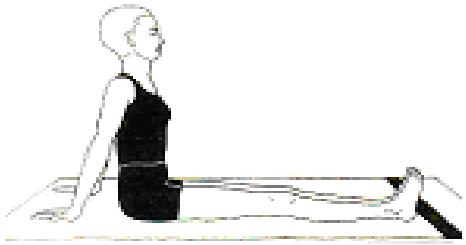
TRAINING SCHEDULE FORTAI-CHI TRAINING

Sl.No.	Yang Style of 24 Forms	Repetition			Rest between Exercise	Rest between sets	Frequency per week
		First Four Weeks (40 min)	5th to 8th week (50 min)	9th to 12th week (60 min)			
1.	Opening of Tai Chi	2	4	6	10 secs	30 sec	6 days
2.	Parting Wild Horse's Mane	2	4	6	10 secs	30 sec	6 days
3.	White Crane Flashing Wings	2	4	6	10 secs	30 sec	6 days
4.	Brush Knee, Twist Steps	2	4	6	10 secs	30 sec	6 days
5.	Play the Pei Pa (Lute)	2	4	6	10 secs	30 sec	6 days
6.	Repulse Monkey	2	4	6	10 secs	30 sec	6 days
7.	Left Grasp Sparrow's Tail	2	4	6	10 secs	30 sec	6 days
8.	Right Grasp Sparrow's Tail	2	4	6	10 secs	30 sec	6 days
9.	Single Whip	2	4	6	10 secs	30 sec	6 days
10.	Wave Hands Through Clouds	2	4	6	10 secs	30 sec	6 days
11.	Single Whip	2	4	6	10 secs	30 sec	6 days
12.	High Pat on Horse	2	4	6	10 secs	30 sec	6 days
13.	Right Heel Kick	2	4	6	10 secs	30 sec	6 days
14.	Punching Temples	2	4	6	10 secs	30 sec	6 days
15.	Left Heel Kick	2	4	6	10 secs	30 sec	6 days
16.	Low Form, Stands on Left Leg	2	4	6	10 secs	30 sec	6 days
17.	Low Form, Sands on Right Leg	2	4	6	10 secs	30 sec	6 days
18.	Fair Lady Works the Shuttles	2	4	6	10 secs	30 sec	6 days
19.	Needle to Sea Bottom	2	4	6	10 secs	30 sec	6 days
20.	Fan Through Back	2	4	6	10 secs	30 sec	6 days
21.	Turn, Deflect, Parry, and Punch	2	4	6	10 secs	30 sec	6 days
22.	Apparent Closing Up	2	4	6	10 secs	30 sec	6 days
23.	Cross Hands	2	4	6	10 secs	30 sec	6 days
24.	Closing of Tai Chi	2	4	6	10 secs	30 sec	6 days

3.12.Description of Yogic Practices -

3.12.1 Loosening Exercises

Prarambhik Sthiti (base position)



- Sit with the legs outstretched, feet close together but not touching.
- Place the palms of the hands on the floor to the sides, just behind the buttocks.
- The back, neck and head should be comfortably straight. Straighten the elbows.
- Lean back slightly, taking the support of the arms.
- Close the eyes and relax the whole body in this position.

Practice 1: Padanguli Naman (toe bending)

- Sit in the base position with the legs outstretched and the feet together. Place the hands beside and slightly behind the buttocks.
- Lean back a little, using the arms to support the back.
- Keep the spine straight.
- Be aware of the toes. Move only the toes of both feet slowly backward and forward, keeping the feet upright and the ankles relaxed and motionless.
- Hold each position for a few seconds. Repeat 10 times.

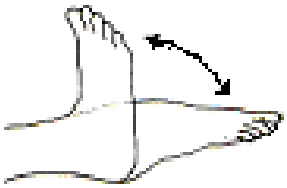
Breathing

- Inhale as the toes move backward.
- Exhale as the toes move forward.

Awareness

- On the stretching produced by the movement and the breath.

Practice 2: Goolf Naman (ankle Bending)



- Remain in the base position.
- Slowly move both feet backward and forward, bending them from the ankle joints.
- Try to stretch the feet forward to touch the floor and then draw them back towards the knees.
- Hold each position for a few seconds. Repeat 10 times

Breathing

- Inhale as the feet move backward.
- Exhale as the feet move forward.

Awareness

- On the stretch in the foot, ankle, calf and leg, and the breath.

Practice 3: Goolf Chakra (ankle rotation)

- Remain in the base position.
- Keep the leg shoulder-width apart and straight.
- Keep the heels on the ground throughout the practice.

Breathing

- Inhale on the upward movement.
- Exhale on the downward movement.

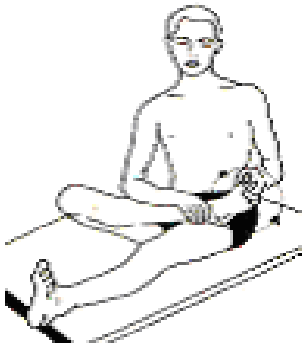
Awareness

- On the rotation of the ankle and the breath.

Practice 4: Goolf Ghoornan (ankle crank)

- Remain in the base position.

- Bend the right knee and bring the foot towards the groin. Turn the knee out to the side and if there is no strain, gently place the foot on the left thigh. Make sure the ankle is far enough over the thigh to be free for rotation.



- Hold the right ankle with the right hand. Hold the toes of the right foot with the left hand. With the aid of the left hand, slowly rotate the right foot 10 times clockwise, then 10 times anti-clockwise.
- Change the leg and repeat with the left foot placed on the right thigh.

Breathing

- Inhale on the upward movement.
- Exhale on the downward movement.

Awareness

- On the rotation and the breath.

Practice 5: Janufalak Akarshan (kneecap contraction)

- Stay in the base position.
- Gently contract the muscle surrounding the right knee, drawing the kneecap back towards the thigh.
- Hold the contraction for 3 to 5 seconds, counting mentally.
- Release the contraction and let the kneecap return to its normal position.
- Practice 10 times. Repeat with the left kneecap 10 times, then with both kneecaps together.

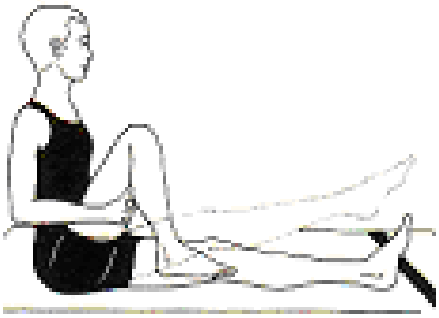
Breathing

- Inhale while contracting.
- Exhale while relaxing the knee muscles.

Awareness

- On the contraction and the breath.

Practice 6: Janu Naman (knee bending)



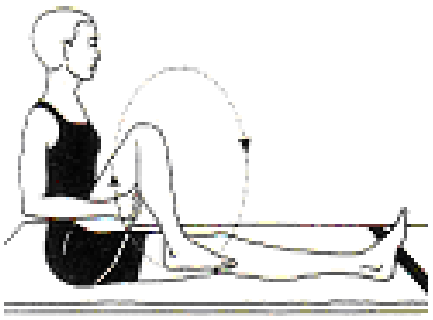
Breathing

- Inhale while straightening the legs.
- Exhale while bending the legs.

Awareness

- On the knee bend and associated movement and the balance, and the breath.

Practice 7: Janu Chakra (knee crank)



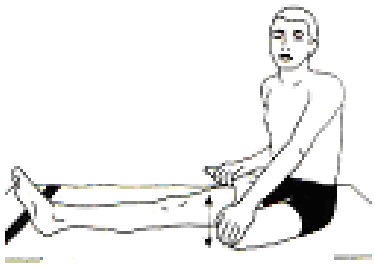
Breathing

- Inhale on the upward movement.
- Exhale on the downward movement.

Awareness

- On the movement and perfection of circular rotation, and the breath.

Practice 8: Ardha Titali asana (half butterfly)



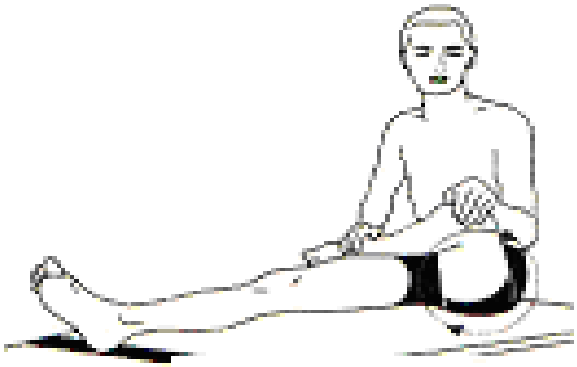
- Sit in the base position.

- Bend the right leg and place the right foot comfortably on the left thigh.
- Place the right hand on top of the bent right knee.
- Hold the toes of the right foot with the left hand.
- This is the starting position.

Awareness

- On the movement of the knee, ankle and hip joints, relaxation of the inner thigh muscles, and the breath.

Practice 9: Shroni Chakra (hip rotation)



- Sit in the same starting position as for Ardha titali asana with the right foot on the left thigh. Use the right hand to rotate the right knee in a circle and make the circular movement as large as possible.
- The index finger may be pointed out and used as a guide to perfection of the circular movement. Practice 10 rotations clockwise and then 10 rotations anticlockwise.
- Straighten the leg slowly. Repeat with the left leg

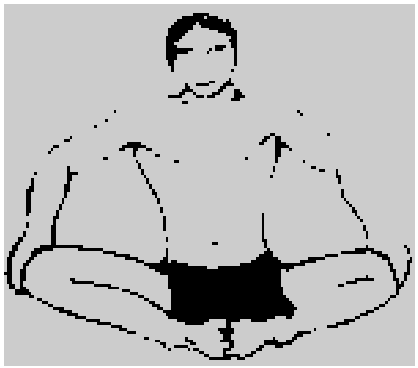
Breathing

- Inhale on the upward movement.
- Exhale on the downward movement.

Awareness

- On the rotation of the knee, ankle and hip joint, and the breath.

Practice 10: Poorna Titali Asana (full butterfly)



- Sit in the base position.
- Bent the knees and bring the soles of the feet together,
- Keeping the heels as close to the perineum as possible.
- Fully relax the inner thigh muscles.

Breathing

- Normal breathing, unrelated to the practice.

Awareness

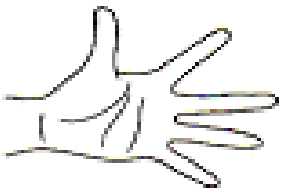
- On the hip joint, movement and relaxation.

Contra-indications

- People with sciatica and sacral conditions should avoid this asana.

Practice 11: Mushtika Bandhana (hand clenching)

- Stretch out your arms
- Fold your fingers in fist first and then unfold them.



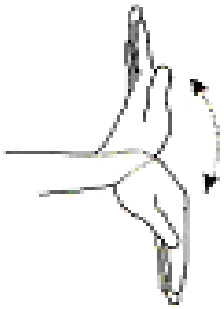
Breathing

- Inhale on opening the hands.
- Exhale on closing the hands.

Awareness

- On the stretching sensation and movement, and the breath.

Practice 12: Manibandha Naman (wrist bending)



- Open your hand and stretch downward and then backward.

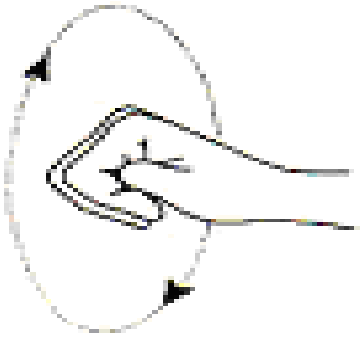
Breathing

- Inhale with the backward movement.
- Exhale with the forward movement.

Awareness

- On the movement in the wrist joint and stretching of the forearm muscles, and the breath.

Practice 13: Manibandha Chakra (wrist joint rotation)



- Fold your fingers into fist and rotate at the wrist clockwise and counterclockwise

Benefits

- The hand and wrist asanas are beneficial for the related joints. They also relive tension caused by prolonged writing, typing and so on.

Practice 14: Kehuni Naman (elbow bending)

- Fold hands at elbow so that the fist rests on the shoulders then unfold it.

Breathing

- Inhale while straightening the arms.
- Exhale while bending the arms.

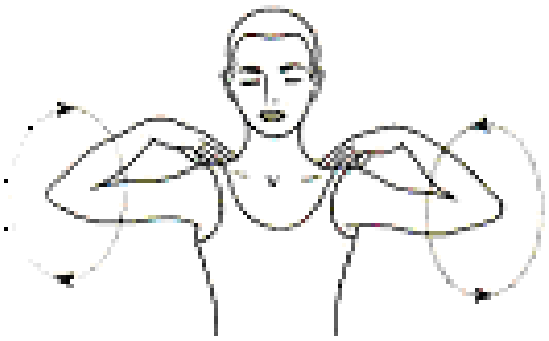
Awareness

- On the movement of the elbow joint and arm muscles, and the breath.

Practice 15: Kehuni Chakra (elbow rotation)

Breathing

- Inhale on the upward stroke.
- Exhale on the downward stroke.



Awareness

- On the rotation of the elbow joint with the breath and on keeping the upper arm steady.

Variation

- To begin with, the left hand can support the right arm just above the elbow, so that the upper arm remains steady throughout the practice.

Practice 16: Skandha Chakra (shoulder socket rotation)

- Lift your shoulder and then rotate your shoulders clockwise and counter clockwise.

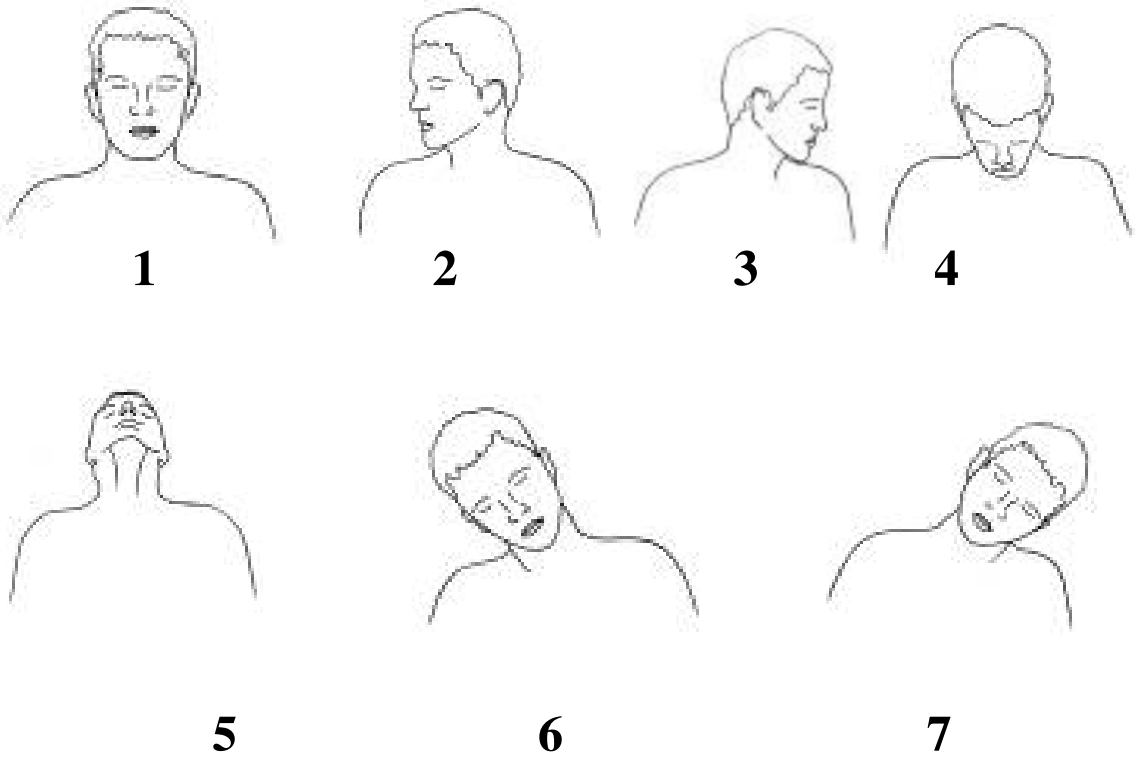
Breathing

- Inhale on the upward stroke.
- Exhale on the downward stroke.

Awareness

- On the stretching sensation around the shoulder joint and the breath.
-

Practice 17: Greeva Sanchalana (neck movements)



1. Sit crosses legs, hands on your Knee or in your lap
2. Slowly rotate head to the right.
3. Now slowly rotate head to the left.
4. Now slowly bring head back to center position.
5. Now slowly move your head up and then slowly bring it back down.
6. Then look straight ahead and lower the head to right - towards the shoulder
7. And then to the left

Benefits

- All the nerves connecting the different organs and limbs of the body pass through the neck. Therefore, the muscles of the neck and shoulders accumulate tension, especially after prolonged work at a desk.

These asanas release tension, heaviness and stiffness in the head, neck and shoulder region **(Swami Satyananda Saraswati, 1969).**

3.12.2.Surya Namaskara

Each stage of surya Namaskara is accompanied by regulation of breath. The 12 counts of the surya Namaskara are as follows: **(Swami Satyananda Saraswati, 1981)**

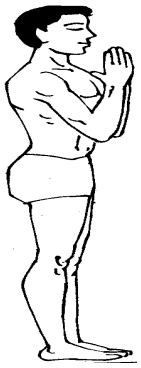
POSITION 1: PRANAMASANA (PRAYER POSES)

Keep the eyes closed.

Remain standing upright with the feet together.

Slowly bend the elbows and place the palms together in front of the chest in namaskara mudra, mentally offering homage to the sun, the source of all life.

Relax the whole body.



Breathing:

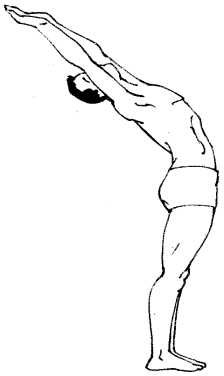
- Breath : Exhale , Breathe normally
- Chakra : Anahata
- Surya mantra : Om Mitraya Namaha
- Bija mantra : Om hram
- Muscles : postural, from soles of feet to crown of the head
- Organs/glands : cerebellum, thymus
- Benefits : establishes balance, concentration ,calmness

- ✷ Spiritual : raising consciousness to higher levels of awareness

POSITION 2: HASTA UTTHANASANA (RAISED ARMS POSE)

Separate the hands raise and stretch both arms above the head, keeping them shoulder width apart.

Bend the head, arms and upper trunk slightly backward.

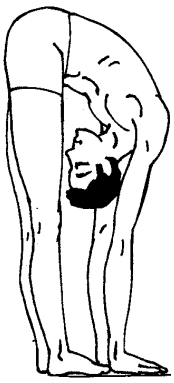


- ✷ Breath : Inhale
- ✷ Chakra : Vishuddhi
- ✷ Surya mantra : Om Ravaye Namaha
- ✷ Bija mantra : Om hrim
- ✷ Muscles : back, shoulders, arms, chest, abdomen
- ✷ Organs/glands : kidneys, intestines, lungs, adrenal glands, thyroid / parathyroid,
- ✷ Benefits : opening emotionally, corrects poor posture
- ✷ Spiritual : Invoking the grace and power of higher forces

POSITION 3: PADAHASTASANA (HAND TO FOOT POSE)

Bend forward from the hips until the fingers or palms of the hands touch the floor on either side of the feet.

Bring the forehead as close to the knees as is comfortable. Do not strain. Keep the knees straight.

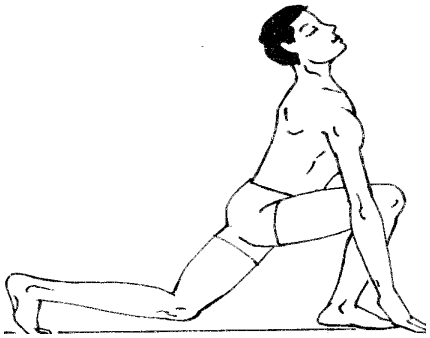


- Breath : Exhale
- Chakra : Swadhisthana
- Surya mantra : Om Suryaya Namaha
- Bija mantra : Om hroom
- Muscles : hamstrings, buttocks, back, neck, shoulders
- Organs/glands GIT, : kidneys, thyroid
- Benefits : improves digestion, circulation & respiration
- Spiritual : surrender to the powerful forces of gravity
-

POSITION 4: ASHWA SANCHALANASANA (EQUESTRIAN POSE)

Place the hands on the floor beside the feet. Stretch the right leg back as far as is comfortable and grasps the floor with the toes.

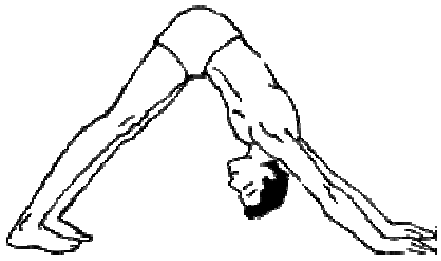
At the same time, bend the left knee, keeping the left foot on the floor in the same position. Keep the arms straight. In the final position, the weight of the body should be supported on hands, the left foot, right knee and toes of the right foot. The head should be tilted backward, the back arched and the inner gaze directed upward to the eyebrow center.



- Breath : inhale
- Chakra : Ajna
- Surya mantra : Om Bhanave Namaha
- Bija mantra : Om hraim
- Muscles : legs, buttocks, abdomen, thorax and neck
- Organs : cerebellum
- Benefits : sense of balance, centre of gravity
- Spiritual : removes darkness from delusions
-

POSITION 5: PARVATASANA (MOUNTAIN POSES)

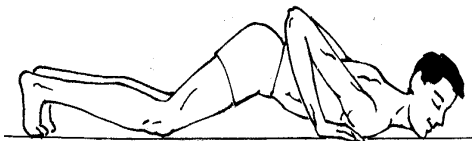
Keep the hands and right foot still, and take the left foot back beside the right foot. Simultaneously, raise the buttocks and lower the head between the arms so that the back and legs form two sides of a triangle. The legs and arms straighten in the final position and the heels come down towards the floor in the final pose. Bring the head and shoulders towards the knees. Do not strain.



- Breath : exhale
- Chakra : Vishuddhi
- Surya mantra : Om Khagaya Namaha
- Bija mantra : Om hraum
- Muscles : legs, buttocks, abdomen, thorax and neck
- Organs : cerebellum, tones spinal nerves
- Benefits : sense of balance, centre of gravity, improves circulation
- Spiritual : Salute to the one by whom time is measured

POSITION 6: ASHTANGA NAMASKARA (SALUTE WITH EIGHT PARTS OR POINTS)

Keep the hands and feet in place. Lower the knees, chest and chin to the floor, the feet will come up on to the toes. In the final position only the toes, knees, chest, hands and chin touch the floor. The knees, chest and chin should touch the floor simultaneously. If this is not possible, first lower the knees, then the chest, and finally the chin. The buttocks, hips and abdomen should be raised.

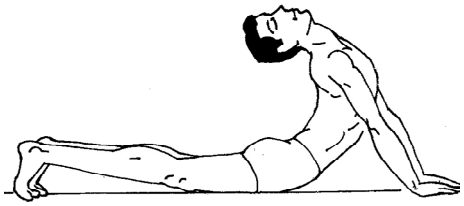


- Breath : retain breath (out)
- Chakra : Manipura
- Surya mantra : Om Pushne Namaha
- Bija mantra : Om hraha
- Muscles : legs, buttocks, abdomen, thorax and neck, shoulders, forearms
- Organs : recharges solar plexus, stimulates metabolism, Adrenal glands, Kidneys
- Benefits : strengthening and nourishing the body
- Spiritual : Salute to the giver of strength

POSITION 7: BHUJANGASANA (COBRA POSE)

Keep the hands and feet in place. Slide the chest forward and raise first the head, the shoulders, then, straightening the elbows, arch the back into the cobra pose. This will lower the buttocks and hips to the floor. Bend the head back and direct the gaze upward to the eyebrow center. The thighs and hips remain on the floor and the arms support the trunk.

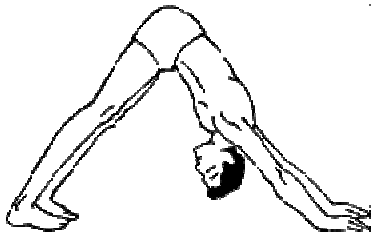
Unless the spine is very flexible the arms will remain slightly bent.



- Breath : inhale
- Chakra : Swadhisthana
- Surya mantra : Om Hiranya Garbhaya Namaha
- Bija mantra : Om hram
- Muscles : stretches abdomen muscles, anterior neck muscles strengthens posterior back muscles
- Organs : kidney and liver, digestive system
- Benefits : Good for asthma, constipation Spiritual praying to the awakening of creativity

POSITION 8: PARVATASANA (MOUNTAIN POSE)

The hands and feet do not move from position 7. From Bhujangasana assume parvatasana. Keep the arms and legs straight, grip the floor with the toes and use the strength of the arms to raise the buttocks and lower the heels to the floor.



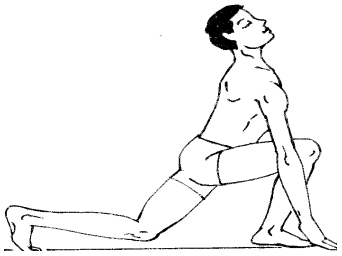
- Breath : exhale
- Chakra : Vishuddhi
- Surya mantra : Om Marichaye Namaha
- Bija mantra : Om hrim
- Muscles : legs, buttocks, abdomen, back and neck
- Organs : thyroid
- Benefits : stretches spinal nerves, circulation
- Spiritual : salutations to the lord of the dawn

POSITION 9: ASHWA SANCHALANASANA (EQUESTRIAN POSE)

Keep the palms flat on the floor and the right foot in place.

Bend the left leg and bring the left foot forward between the hands. Simultaneously, lower the right knee so that it touches the floor and push the pelvis forward.

Tilt the head backward, arch the back and gaze at the eyebrow center.

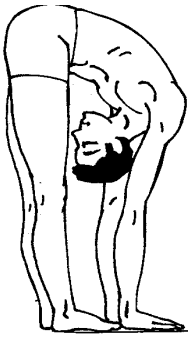


- Breath : inhale
- Chakra : Ajna
- Surya mantra : Om Adityaya Namaha
- Bija mantra : Om hroom
- Muscles : stretches hip muscle, strengthens quads loosens tight hips
- Organs : massages abdominal organs, nervous system
- Benefits : nervous system, pineal gland
- Spiritual : salutations to he who illumines
-

POSITION 10: PADAHASTASANA (HAND TO FOOT POSE)

Bring the right foot forward next to the left foot. Straighten both legs.

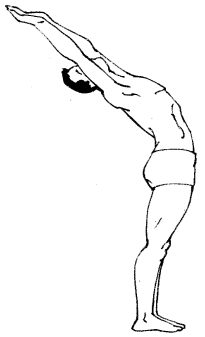
Bring the forehead as close to the knees as possible without straining.



- Breath : Exhale
- Chakra : Swadhisthana
- Surya mantra : Om Savitre Namaha
- Bija mantra : Om hraim
- Muscles : stretches hamstrings, buttocks, back, Posterior neck, shoulders muscles
- Organs/glands GIT, : kidneys, thyroid
- Benefits : improves digestion, circulation & respiration
- Spiritual : salutations to the benevolent mother

POSITION 11: HASTA UTTANASANA (RAISED ARMS POSE)

Keep the arms and spine in a straight line.Raise the torso and stretch the arms above the head.Keep the arms separated, shoulder width apart.Bend the head, arms and upper trunk backward slightly.

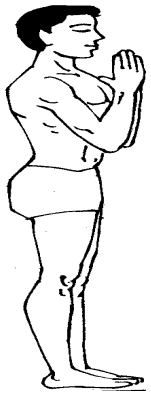


- Breath : Inhale
- Chakra : Vishuddhi
- Surya mantra : Om Arkaya Namaha
- Bija mantra : Om hraum
- Muscles : back, shoulders, arms,chest, abdomen
- Organs/glands : kidneys, intestines, lungs, adrenal glands, thyroid/parathyroid,
- Benefits : opening emotionally, corrects poor posture

- Spiritual : salutations to he who is fit to be praised

POSITION 12: PRANAMASANA (PRAYER POSES)

Bring the palms together in front of the chest.



Breathing:

- Breath : Exhale while assuming the final position.
- Chakra : Anahata
- Surya mantra : Om Bhaskaraya Namaha
- Bija mantra : Om hraha
- Muscles : postural, from soles of feet to crown of the head
- Organs/glands : cerebellum, thymus
- Benefits : sense of balance, centre of gravity, concentration
- Spiritual : salutations to he who leads to enlightenment.

(Swami Satyananda Saraswati, 1973).

3.12.3.Virkshasana

Step 1**:** Stand straight and keep one's feet close to each other. One's knees, legs and hand should be straight.

Step 2:Now bring one's right feet and keep it on one's left thigh. Try to make a right angle. If one are unable to keep your foot on the thigh, try to keep one's foot on the left leg wherever one feel comfortable and maintain balance. But remember one's right toe should point downwards. One's body balance should depend on the left leg.

Step 3: Now join one's palms and bring them to the middle of one's chest and keep the figure pointing upwards. Now slowly move one's hands overhead. Raise one's arms over one's head. One's arms should be slightly bent.

Step 4:Stand straight, look in the front and be relaxed. Breathe normal.

Step 6:Now slowly bring one's hands in the middle portion of the chest same as before, bring one's right leg to the ground and come back in the starting position.

Step 7:Repeat the same procedure with another leg.

3.12.4.Trikonasana

Stage 1: Take a deep inhalation and with a jump spread the legs apart sideways 3 to 3.5 feet.

Stage 2: Turn the right foot sideways 90 degrees to the right.Turn the left foot 60 degrees to the right, keeping the left leg stretched out and tightened at the knee.

Stage 3: Left leg in the opposite direction so as to bring the left palm on the floor near the outer side of the right foot.

Stage 4: Stretch the right arm up, bringing it in line with the left arm. Gaze at the right thumb.

Stage 5: Stretch both the shoulders and shoulder-blades

3.12.5.Padmasana

1. Sit on the ground by spreading the legs forward.
2. Place the right foot on the left thigh and the left foot on the right thigh.
3. Place the hands on the knee joints.
4. Keep the body, back and head erect.
5. Eyes should be closed.
6. One can do Pranayama in this asana.
7.

3.12.6.Paschimottanasana (posterior stretching posture)

Position: Sitting, legs together and extended.

Stage 1: Bend one's index fingers to form a hook and hold the great toes with them and bend the elbows. Exhale while bending forward bringing one's head between the hands

Stage 2: Bending the elbows and the trunk further, try to touch the knees with one's forehead without raising the knees.

Stage 3: Inhale now, as one raise one's head slowly bringing it between the hands.

Stage 4: Raise the trunk and the head leaving the toes and straightening the spine, with one's hands on the sides and back to the position.

3.12.7.Ardha Matsyendrasana (Spinal Twist)

Position: Sit on one's heels. Knees and feet should be together, and the chest faces forwards.

Stage1: Gently shift one's buttocks down to the floor on the left side of one's legs. Keep one's back straight and centered over the buttocks.

Stage 2: Bring one's right knee in close to one's chest, and gently lift it over one's left leg; place the right foot flat on the floor by one's left knee.

Stage 3: Keep one's body straight and upright, turn one's body to the right and place one's right hand flat on the floor. Raise one's left arm and stretch it up above one's head.

Stage 4: Twist one's body to the right and look over one's shoulder. Carry one's left arm around one's right knee, clasping one's right ankle. Hold the pose for 30 seconds. Repeat on the other side.

3.12.8.Upavistha Konasana

1. Sit with one's legs open to a 90 degree angle (with one's pelvis in the centre).
2. Flex one's feet to align the knees, toes pointing up to the sky. If one feel one's pelvis rocking back, or one feel a loss of the curve in the low back, sit up on some height like a firm cushion to allow the pelvis to tilt forward.

3. Place the finger tips on the floor behind one's hips.
4. Inhale, drawing up the sides of the body, creating space in the spine. Stay here if one are already feeling a substantial stretch in the legs.
5. Before folding, first support one's low back using one's core musculature. Draw the muscles of one's pelvic floor gently upward with mulabhanda (the same muscles you use to stop and start the flow of urine), also draw in one's lower abdomen gently.
6. Exhale as one start to walk one's hands out in front of one.
7. Slowly, using one's breath as a guide, keep one's spine long and lead with one's heart.
8. Stop when one feel one have reached a challenging but sustainable position. Rather than trying to get closer to the eath, imagine growing longer through the spine.
9. Breathe comfortably as one hold this forward bend.
10. To exit the pose, exhale and reconnect with one's core muscle support and then slowly walk one's hands back towards one's body.
11. Gently bend one's knees and bring the legs back together.

3.12.9.Supta Virasana

Step 1:Perform Virasana. Exhale and lower one's back torso toward the floor. First lean onto one's hands, then one's forearms and elbows. Once one are on one's elbows, place one's hands on the back of the pelvis and release one's lower back and upper buttocks by spreading the flesh down toward the tailbone. Then finish reclining, either onto the floor or a support.

Step 2: If one's front ribs jut up sharply toward the ceiling, it's a sign of tight groins, which pulls one's front pelvis toward one's knees and causes one's belly and lower back to tense. Use one's hands to press one's front ribs down slightly and lift one's pubis toward your navel. This should lengthen one's lower back and lower it toward the floor. If it doesn't, raise yourself onto a higher support. Then lay one's arms and hands on the floor, angled about 45 degrees from the sides of one's torso, palms up.

Step 3: Sink the heads of the thighbones deep into the back of the hip sockets. It's alright to lift one's knees a little away from the floor to help soften one's groins; in fact, one can raise one's knees a few inches on a thickly folded

blanket. One can also allow a little bit of space between one's knees as long as one's thighs remain parallel to each other. Do not, however, allow the knees to splay apart wider than your hips – this will cause strain on the hips and lower back.

Step 4: To begin, stay in this pose for 30 seconds to 1 minute. Gradually extend one's stay to 5 minutes. To come out, press one's forearms against the floor and come onto one's hands. Then use one's hands to lift one's torso into Virasana. As one come up, lead with one's sternum, not one's head or chin. Come out of Virasana in the recommended manner.

3.12.10.Krounchasana

Step 1: Sit in Dandasana (Staff Pose). Bring one's left leg into Ardha Virasana. Then bend one's right knee and place the foot on the floor, just in front of the right sitting bone. Place your right arm against the inside of the right leg (so that one's shoulder presses against the inner knee). Cross one's hand in front of the right ankle and grasp the outside of the right foot. Finally grasp the inside of the right foot with one's left hand.

Step 2: Lean back slightly, but keep the front torso long. Firm the shoulder blades against one's back to help maintain the lift of the chest. Inhale and raise the leg diagonally to the floor, angled about 45 degrees, or with the foot as high as or slightly higher than one's head.

3.12.11.Dhanurasana (Bow pose)

Position: Lie prone with one's feet together and hands placed on the sides.

Stage 1: Lie on one's front with one's forehead on the floor. Bend one's knees and reach one's arms back until one's hands can grip one's ankles.

Stage 2: Inhale. Raise one's head, chest, and legs and attempt to straighten one's legs.

Stage 3: Hold the pose for 10-30 seconds while breathing normally.

Stage 4: Exhale while releasing the pose. Repeat three times.

3.12.12.MATSYASANA

Technique

- Lie on your back with your knees bent and arms at your side.
- Arch your back as much as you can while raising it off the ground by pushing the floor with your elbows. At the same time, throw your head backwards, resting the crown of your head on the floor. Use your forearm and elbows to support you.
- Expand your chest. Breathe deeply with the abdomen and concentrate on the thyroid gland.
- Stay in this position for about one minute. Slowly come back to the starting position.

Benefits

- The fish posture normalizes the function of the thyroid, pituitary, pineal and adrenal glands. It limbers and stretches the neck, strengthens and tones the nervous system, the kidneys, the stomach and intestines, the pelvic organs, and the nerves connected with the sex functions.
- This is the only posture in this sequence which bends the spine (including the neck) backwards. This is essential, to counteract the preceding asanas which bend the spine forwards. The result is to give a healthy stretch to the muscles and ligaments of the spine in the opposite direction.

3.12.13.Sarvangasana

Stage 1: Lie flat on the back on the carpet keeping the legs stretched out tightened at the knees. Place the hands by the side of the legs, palms down. Take a few deep breaths.

Stage 2: Exhale, bend the knees and move the legs towards the stomach till the thighs press it. Take the two breaths.

Stage 3: Raise the hips from the floor with an exhalation and rest the hands on them by bending the arms at the elbows. Take two breaths.

Stage 4: Exhale, raise the trunk up perpendicularly supported by the hands until the chest touches the chin.

Stage 5: Only the back of the head and the neck, the shoulders and the backs of the arms up to the elbows should rest on the floor. Place the hands in the middle of the spine. Take two breaths.

Stage 6: Exhale and stretch the legs straight with the toes pointing up.

3.12.14.Halasana (Plough Posture)

Position: Lie supine with one's feet together and hands placed on the sides.

Stage 1: Raise both one's legs in a steady movement up to 90-degree

Stage 2: Without bending the legs, slowly raise the hips and the lower part of one's back. Bring down the legs until the toes touch the floor beyond one's head.

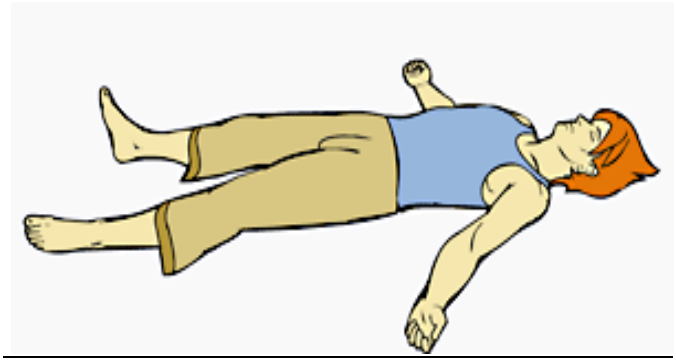
Stage 3: Push the legs further from one's head, and maintain this stage for few seconds.

Stage 4: Get back to starting position slowly and stage by stage.

3.12.15.Shavasana (Corpse pose)

Stage 1: Keep upper and lower limbs in a relaxed position. Upper limb making an angle of 15-degrees with the trunk and the lower ones about 30-degrees apart

Stage 2: Close the eyes with drooping eyelids, breathing deeply.



Stage 3: Concentrate on

(1)The sensation at the nostrils

(1) The coolness of the inspired air

(2) The warmth of the expired air

Stage 4: Slowly open one's eyes turn to a side and get up.

PRANAYAMA TECHNIQUES

3.12.16.Bhastrika

Purpose

A large amount of Prana Vayu is supplied to the body.

Procedure

Sit in padmasana and make the body erect. Make the mind thought-free and relaxed. Now close the right nostril with one's right thumb, inhale and exhale with full force. First do this slowly, and then increase one's speed. In the end, inhale fully, close the left nostril with one's third finger, and perform all the three Bandhas. Increase the Kumbkaha according to one's capacity. Now open the Bandhas slowly, lift the thumb from the right nostril and exhale through it slowly. Relax for a moment. Repeat this process by closing the left nostril.

3.12.17.Nadi Shodhana

Purpose

The purpose of paranayama is to purify the nerves and thereby to strengthen the nervous system.

Procedure

Sit in any comfortable posture. Make one's breathing normal. Close one's right nostril with one's thumbed and fills in the breath through the left nostril. When the breathe has been filled inside close the left nostril with one's third finger and stay in this state of Antrik Kumbhaka for a few seconds. Then lift the thumb from the right nostril and exhale slowly, keeping the left nostril closed. Repeat the process by inhaling through the left nostril and exhaling through the right nostril.

3.13.Tai chi Exercises 1- 12

1-Opening

2-Part Horses Mane

3-White Crane Spreads Wings

4-Brush Knee Twist Step

5-Play the Lute

6-Repulse Monkey

7-Left Grasp Birds Tail

8-Right Grasp Birds Tail

9-Single Whip

10-Wave Hands Like Clouds

11-Single Whip

12-High Pat On Horse

Tai chi Exercises 13-24

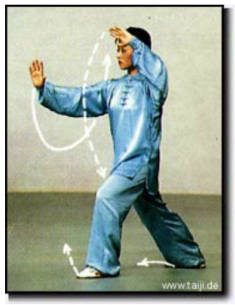
13-Right Heel Kick

14-Punch Ears

15-Left Heel Kick

16-Lower Movement Stand on Left Leg

17-Lower Movement Stand on Right Leg



18-Work at Shuttles

19-Needle at Sea Bottom

20-Flash the Arm

21-Turn Block Parry and Punch

22-Appears Closing

23-Cross Hands

24-Closing

3.14.Administration of Tests

3.14.1.Spirometer Test

Purpose

Determination of vital capacity

Equipment

Spiro meter, Chair, and nose clips

Procedure

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 he 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)**

3.14.2.Resting Pulse Rate

Objective

The objective of this test was to record the number of pulse beats per minute.

Equipment

A stopwatch 1/10 of a second was used.

Procedure

The pulse rate of all the participants was recorded in the sitting position and in the evening between 3.30 and 4.30pm. Before taking the pulse rate the participants were asked to relax for about 30minutes. To record the pulse rate the fingertips were placed on the radial artery at the wrist in such a manner that palpitation was clear (**Clarke, 1976**).

Scoring

The number of palpitation was counted for one full minute.

3.14.3.Breathe Holding Time

Objective

The objective was to measure the ability of the subject to hold the breathe for a longer time.

Equipment

A stopwatch with calibration of 1\10 seconds, score sheet and a pencil.

Procedure

The participant was instructed to stand at ease and inhale deeply after which he holds his breath for as long as possible. The index finger of the respondent served as an indicator of the investigator to know the start and end of the recording time. The thumb and middle finger were used to hold the nose to avoid letting the air through the nostrils. The subject was instructed not to let the air out by opening the mouth while recording the breath holding time.

Scoring

Two trials were given. Best performances was taken into consideration. (**Astrand and Rodahl, 1977**)

3.15.Collection of Blood Sample for Bio-Chemical Variables

Subjects were asked to report at the laboratory after an overnight fasting and 10.0 ml of venous blood samples were collected in heparins test tubes. Thus the pre-samples were collected in two days prior to training and after the twelve-week-training programme on blood glucose and TC.

3.15.1.Computerized Semi- Auto Analyzer Randox – Imola for Bio-Chemical Variables

Purpose

- To assess the blood glucose, total cholesterol and triglycerides.

Equipment

Semi- Auto Analyzer RANDOX - IMOLA

Procedure

The blood was allowed to collect 15-20min and the serum was separated by centrifuging 3000-4000RPM for 10minutes all chosen biochemical variables were estimated by using serum in semi auto analyzer.

Score

Blood glucose, TC and TGL was measured on mg/dL level.

3.16.Administration of the Questionnaires

3.16.1.Sports Competition Anxiety Test (SCAT)

Objective

To find out the amount of anxiety.

Equipment and Materials

Anxiety was assessed through the Sports Competition Anxiety Test questionnaire. (SCAT)

Procedure

Sports Competition Anxiety Test questionnaire (SCAT) prepared by Rainer Martens has been widely used for measuring anxiety related to sports situation in most of the advanced countries. The test was reliable and valid and designed to measure the degree of anxiety prior to the competition.

The SCAT questionnaire was administered to all the subjects. Each subject was asked to answer all the 15 items of the tests and was instructed to express the choice most honestly. The SCAT has fifteen items out of which five are spurious questions, which have been added to the questionnaire to diminish biased responses. The subjects were instructed to respond to each item according to how they generally feel in competitive sports situations.

Every statement had three possible responses as mentioned below.

a. Hardly ever

b. Sometimes

c. Often

The ten test items, which were taken for scoring purpose, are 2, 3, 5, 6, 8, 9, 11, 12, 14 and 15. The remaining items were spurious items, which were not taken for scoring purpose are 1, 4, 7, 10 and 13.

The scholar scrutinized the completed questionnaires in order to ensure that the subject had responded to every item and there was no question left unanswered. The items 2,3,5,8,9,12,14 and 15 were evaluated in a uniform manner using the following key.

Response		**Score**
Hardly ever	=	1
Sometimes	=	2
Often	=	3

In case of items 6 and 11, scoring was carried out using the following key.

Response		**Score**
Often	=	1
Sometimes	=	2
Hardly ever	=	3

However, spurious question i.e. 1, 4, 7, 10 and 13 were not scored out as suggested by Rainer Martens.

Scores obtained by each subject on each statement was added up and that represented one's total score on sports competition anxiety.

There was no right or wrong answers. The subjects were not allowed to spend too much time on any statement. The subjects were asked to choose the word that described the best opinion that they usually feel while participating in sports and games. (**Appendix I**)

3.16.2.Rosenberg Self Esteem Scale

Test:

Self Esteem Questionnaire developed by Rosenberg

Purpose:

To find out the Self Esteem of the Middle age women.

Equipment:

Rosenberg's Self-Esteem Scale

Procedure:

The Rosenberg's Self-Esteem Scale was used to measure the Self Esteem. The purpose and the method to answer the Rosenberg's Self-Esteem Scale were explained to the subject clearly. A score of one was awarded for a response indicative of Depression that is, for marking the item numbers as strongly agree = 3 Agree = 2, Disagree = 1, strongly disagree = 0.

Scoring

Scoring was the total number of points by each subject as per the questionnaire answer.

3.16.3.Sports Achievement Motivation Test

Objective

To assess the level of achievement motivation.

Equipment and Materials

Sports achievement motivation test developed by Dr.M.L.Kamalesh

Procedure

In the Sports Achievement Motivation Test questionnaire, there are twenty test items. Among them, for questions 1, 3, 4, 9, 10, 11, 12, 13, 15, 16, 17 and 20, the expected answer is 'a'. For the questions 2, 5, 6, 7, 8, 14, 18 and 19 the expected answer is 'b'. For the correct statement 2 marks and for the incorrect, zero mark were awarded. (**Appendix II**)

3.17 Skill Tests

3.17.1.Mor-Christian Soccer Dribble test

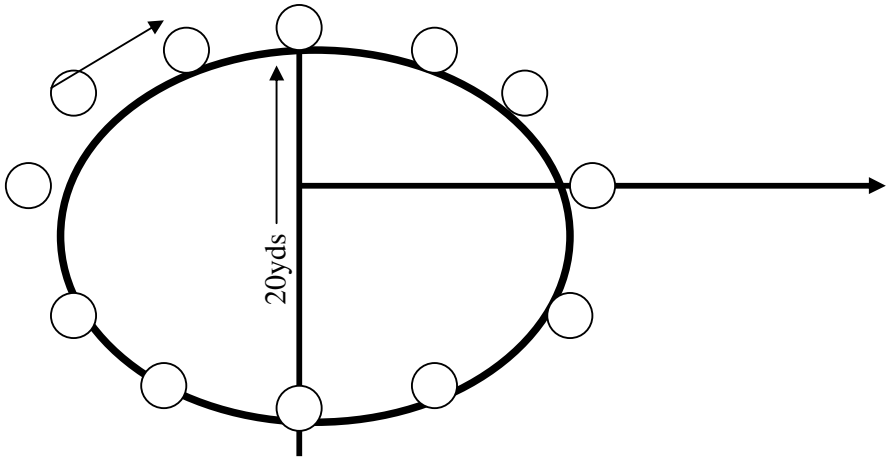
Objective

To measure dribbling ability of the subjects.

Equipments

Stop watch, Cones, football and measuring tape

Markings5yds



Starting line

Procedure

The ball is placed on the starting line. On the signal, 'ready go' the subjects dribbles the ball around the circular course by weaving among the plastic cones until getting back to the starting line. Three trials are given to each subject. The first trial is performed in a clockwise direction, the second in an anticlockwise direction, and the third in the direction of the subject's choice.

Scoring

The combined best two of the three trials is the test score.

3.17.2.Borleske touch football punt for distance test

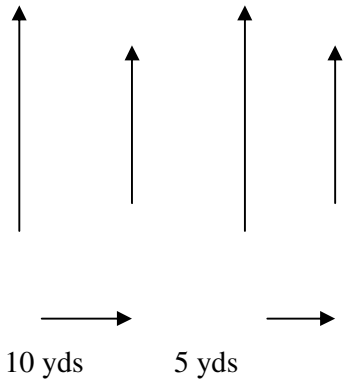
Objective

To measure kicking ability of the subjects.

Equipments

Cones, football and measuring tape

Markings



Procedure

After the warming-up for a period of one minute, the subject stood behind the restraining line after receiving punt within 2 seconds towards the kicking zone. Faraway straightly for correct punt drop the ball in front of the leg and execute the punt before the ball conducted the floor.

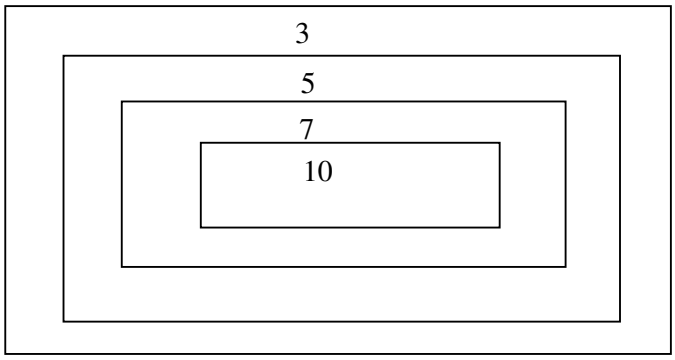
Scoring

Three trials are allowed and the best of three trials is considered as the final scores.

3.17.3.Shooting Skill Test

Purpose: To assess accuracy of shooting skills

Equipment: 2 soccer balls, floor tape, clipboard, paper, and a pen



Procedure

For the shooting assessment, inform players that they should use their instep to kick the ball towards marked lines on the wall. For this, make the squares within squares on the wall. This can be done by marking an inside (smallest) square worth 10 points, the square just outside of smallest square worth 7, another square outside of that worth 5, and outermost worth 2. Arrange the area as described in the diagram on the next page. Players will aim towards the center square. Again, a player gets three chances to score 10 points, or average the three scores out of 10 will be given to players. To assess a player's ability to kick with accuracy, design this arrangement on wall of the gym. Make sure that the bottom line is even with the gym's floor level. Students will kick into these squares from a predetermined distance. For example Player A will kick from 10 feet away, Player B will kick from 15 feet away etc. Give all players 3 chances to score 10.

3.18 COLLECTION OF DATA

The purpose of the study was the effect of yogic practices and tai-chi training on selected physiological, bio-chemical, psychological variables and football playing abilities among women Football players. For this purpose, the research scholar followed the following procedure.

The subjects of the study were selected at random and divided into three homogeneous groups. Among the three groups, the control group was strictly under control, without undergoing any special activity. The experimental groups were undergone with the experimental treatments. The data on selected dependent variables for pre-tests and post-tests were collected two days before and after the training programme respectively. On the first day resting pulse rate, vital capacity, breathe holding time, anxiety, self esteem and dribbling were tested whereas achievement motivation, kicking, kicking and bio-chemical variables was tested on the second day.

3.19 STATISTICAL TECHNIQUE

The data collected from the three groups before and after the experimental period were statistically examined for significant improvement by using Analysis of Covariance (ANCOVA). The data collected from the three groups before and after the experimental period were statistically examined for significant improvement by using

Analysis of Covariance. **(ANCOVA) (Clarke and Clarke, 1972**) Whenever the 'F' ratio was found to be significant, Scheffe's test was used as post-hoc test to determine which of the paired means differed significantly. In all cases the criterion for statistical significance was set at 0.05 level of confidence ($P<0.05$).

Justifications for Using ANCOVA

Analysis of Covariance (ANCOVA) was used to determine how each dependent variable is influenced by independent variables while controlling for a covariate (**Clarke and Clarke, 1972**). Analysis of covariance adjusts the mean of each dependent variable to what they would be if all groups started out equally on the covariate. Analysis of covariance gives results preferable to those of a direct comparison of gain scores i.e., post-test minus pre-test for the two groups, because gains are limited in size by the difference between the test's ceiling and the magnitude of the pre-test score (**Tuckman, 1999**). In this study, pre-test scores of the selected variables have been shown to correlate with the post test scores and thus they were considered as appropriate covariates.

ASSUMPTIONS FORANCOVA

A preliminary analysis was conducted to determine whether the prerequisite assumptions of one-way univariate **ANCOVA** were met before preceding the univariate analysis. Thus, the assumption of equality of variance (homogeneity) was examined and presented below.

Levene's Test of equality of error variance on selected variables was calculated and presented in table V.

TABLE V

LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES ON SELECTED VARIABLES OF YPG TCG AND CG

Variables	F Ratio	df1	df2
Vital capacity	2.11	2	87
Resting pulse rate	1.337	2	87
Breathe Holding Time	2.164	2	87
Blood Glucose	1.361	2	87
Total Cholesterol	0.404	2	87
Triglycerides	1.773	2	87
Anxiety	0.089	2	87
Self-Esteem	2.109	2	87
Achievement Motivation	2.126	2	87
Dribbling	0.946	2	87
Kicking	2.327	2	87
Shooting	1.745	2	87

*significant at 0.05 level

(The table value required for 0.05 level of significance with df 2, 87 is 3.10)

The results from the Levene's Test for homogeneity of variance of comparing the four groups regardless of the ability level for each of the dependent variables indicated that homogeneity of variance has been met for all the seven dependent variables. For Vital capacity, F (2, 87) = 2.11, p> .005, for Resting pulse rate, F (2, 87) = 1.337, p> .005, for Breathe Holding Time, F (2, 87) = 2.164, p> .005, for Blood Sugar, F (2, 87) = 1.361, p> .005, for Total Cholesterol, F (2, 87) = 0.404, p> .005, for Triglycerides, F (2, 87) = 1.773, p> .005, for Anxiety, F (2, 87) = 0.089, p> .005, for Self-esteem, F (2, 87) = 2.109, p> .005, for Achievement motivation, F (2, 87) = 2.126, p> .005, for Dribbling, F (2, 87) = 0.946, p> .005, for kicking, F (2, 87) = 2.327, p> .005and for Shooting, F (2, 87) = 1.745,
p>.001. Hence, it was concluded that the assumption of homogeneity of variance has been met.

After calculating the assumptions of one way univariate ANCOVA, it was concluded that the selected participants in each group have equal variance and they are homogeneous in nature.

After determining that the assumptions were met, the univariate statistical output was examined. Then, providing the ANCOVA result was statistically significant, the univariate results were examined for each variable. For the significant univariate results, the post hoc (Scheffe's) comparisons were performed to identify where the differences resided. The pairwise comparisons statistic was used for the post hoc results. The results of the tests, dependent't' test, univariate tests, the pairwise comparisons (Scheffe's) among the seven variables, as well as the descriptive statistics are reported in Chapter Four.

3.20. Photos

Padmasana

Matsyasana

Paschimottanasana

Dhanurasana

Ashwa sanchalanasana (Surya Namaskara)

Bhastrika Pranayama

Nadisodhana Pranayama

Foot ball players

Tai chi Exercises –Opening

Tai chi Exercises - Play the lute

Tai chi Exercises - Brush knee twist step

Dribbling

3.21 FLOW CHART SHOWING THE METHODOLOGY