CHAPTER-III

METHODOLOGY

The information regarding the selection of the subjects, criterion measure, Administration of the test, Selection of variables, Selection of the test, Experimental Design and Methodology of the Statistical procedure.

3.1: SELECTION OF THE SUBJECTS:

Among the diabetic patient teachers of secondary schools in the urban area of Amravati district of Maharashtra, only the willing mellitus diabetic patient teachers both male and female were sorted out as the subjects of this experimental study. It was done in consultation with the doctors of the patient teachers. The headmasters of the concerned schools and the district sports and education officer extended their hand to conduct the experiment. The treatment program was conducted at the district sports office complex of Amravati district, Maharashtra, as the subjects were residing in the nearest place of the therapeutic treatment center.

The environmental conditions daily routine of work of the subjects were same as those of the non diabetic teachers included as the subjects of the experiment. There age range varied from 35 to 58 years. The experiment was carried out on 96 teacher’s male diabetic teachers and 20 female diabetic teachers and 22 non diabetic male teachers and 10 non diabetic female teachers the diabetic and non diabetic teachers were sorted out from the same secondary schools. Among the 64 diabetic patient teachers consisting 22 male and 10 female who had undergone the following yoga exercises:

(a)Janushirasana
(b)Ardha-Matseyendrasana
(c)Purna-Salbhasana
(d)Halasana
(e)Ustrasana
(f)Dhanurasana
(g)Bhujangasana
(h)Paschimotanasana
(i)Sarvangasana
(h)Shavasana
The subjects were divided in groups of three on the basis of age, sex, severity of illness and attempts were made to maintain homogeneity in grouping as far as it was possible.

The groups were as under:

**GROUP-A:**

For yoga exercises consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

**GROUP-B:**

For control group consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

**GROUP-C:**

For non-diabetic group consisting of 22 (Twenty Two) male and 10 (Ten) female teacher.

**Programme of Experiment:**

Practices were given to the yoga exercise group the prescribed yoga exercises for 6 (Six) days a week for 45 (forty five) minutes each day under direct supervision of the experimenter. A common weekly off day i.e., Sunday was allowed them for rest. All the subjects were directed not to take any medicine, special food during the experimental period. Before and after their involvement in the yoga exercises their organic disorders namely Amount of sugar in blood, Amount of sugar in urine, W.B.C. Count, R.B.C. Count, Body Weight, and their expected role as an effective teacher namely Regularity, Interest in teaching, Participation in co-curricular activities, Co-operative attitude Professional attitude and Teacher pupil relationship were tested and measured with the help of a doctor and with the headmasters teachers and students of the concerned schools respectively. To compare the teaching effectiveness a same number of willing non-diabetic teachers of the same secondary schools were also selected as subject for the experiment to compare the output. The records of measurements were kept about their initial and final scores for evaluation of the effect of yoga exercises produced in their aforesaid organic disorders and teaching effectiveness.
3.2: CRITERIAN MEASURES:

The following criteria measures chosen for testing the hypotheses:

(A) ORGANIC DISORDERS:

Amount of Sugar in Blood:

To measure the amount of sugar in blood of all the selected subjects, the enzymatic test (Biochemical test) like, God-Pod (Glucose oxides-peroxides) kit and computer or photocolorimeter equipment were used. It was measured and recorded in mg/dl.

Amount of Sugar in Urine:

To find out the amount of sugar in urine were tested with the help of dipsticks and color charts (Bayer Company). The amount of sugar in urine all the selected subjects were measured and recorded in percentage.

White Blood Cell (W.B.C.) or Leukocyte Count:

W.B.C. was counted from the same collected blood along with the sugar test. The amount of W.B.C. was counted in the blood cell with the help of W.B.C. diluting pipette, Naubauer Hemocytometer (Counting chamber) and microscope and it was measured in per cubic millimeter.

Red Blood Cell (R.B.C.) or Erythrocytes Count:

R.B.C. was also counted from the same collected blood what was earlier used to find out the amount of sugar in blood. R.B.C. Was counted in the blood cell with the help of R.B.C. diluting pipette, Naubauer Hemocytometer (Counting Chamber) and microscope, and it was measured in million per cubic millimeter.
**Body Weight:**

The total body weight of subject was taken before and after 24 weeks of treatment program with the help of weighing machine and it was recorded in kilogram.

**(B) TEACHING EFFECTIVENESS:**

To assess the effect of selected yoga exercises on teaching effectiveness (Regularity, Interest in teaching, Participation in Co-curricular activities, Co-operative attitude, Professional attitude and teacher pupil relationship) of the Mellitus type-II diabetic patient teachers, some relevant information were necessary before and after the treatment program of 24 weeks for scoring and interpreting the responses. For relevant information separate questionnaires for both the Headmasters/Headmistress as expert ratings and students as students ratings were prepared by the experimenter. The parameters of the teaching effectiveness were prepared by personal contact with the Headmasters/Headmistress of the urban area of the Amravati district of Maharashtra.

**Construction of Questionnaires:**

The researcher has gone through the review of related studies, Internet and related literature but it was not found any parallel questionnaire for the purpose, therefore it was necessary to construct the questionnaires. The selection of questionnaires was an important affair. Questionnaires used in the past and claims of specific questionnaire were also considered. Before selection of the questionnaires, the opinions and suggestions of eminent experts, scholars, doctorate in the field of education and physical education were considered to prepare the questionnaires for headmasters/Headmistress and students as to their simplicity of language and for definite opinions. Items were preliminary finalized on the basis of expert's judgment. The statements selected for questionnaires were divided into 6(six) dimensions. Under these 6(six) dimensions 36 (thirty six) statements were framed and each dimension consist of 6 (six) statements, which were prepared on controversial of different eminent experts in the field of education and physical education.

To finalize the questionnaires the experimenter administered the newly framed questionnaires to 20 (twenty) Headmasters/Headmistress and 120 (one hundred twenty) students (3 students of std. IX and 3 from std. X from each school) from 20 (twenty) schools of Amravati
district. On the basis of result of first try out and with reference to the values of item difficulty and item discrimination, finally 6(six) dimensions were sustained in the questionnaires both for headmasters/headmistress and students. This ensures the preliminary form of the questionnaires.

To ensure the reliability and validity of both the questionnaires, second try out was made. In this stage, the questionnaires consisting of six dimensions were administered on the same Headmasters/Headmistress and students after the gap of 20 (twenty) days. The results of test retest try out were analyzed to estimate the reliability of the test. It was found that the co-efficient of correlation ensures the reliability of the questionnaires (rHm=.91p<0.01, rStn=.87 p<0.0)) which was highly significant.

Since the filtrated questionnaires was made through various above mentioned steps and the contents of the same were modified repeatedly by various experts and necessary changes were made in the question of both the questionnaires and finally it was formulated after the approval of guide, so that the Headmasters/Headmistress and students can express their opinions through the questionnaire regarding the patient teachers. It was assumed that the questionnaires bear the accepted level of content validity. The experts were opined the test was a valid one and the result of co-efficient of correlation indicates the high reliability of the test. Thus from experts judgment and statistical results the questionnaires was accepted as standardized.

In this way the final questionnaires for the headmasters/headmistress and students were prepared to collect the necessary information for the present study.

Administration of Questionnaire:

After construction of questionnaires the experimenter tried to collect information for assessment of teachers teaching effectiveness of selected subjects through separate questionnaire for headmasters/headmistress (expert's ratings) students (student's ratings). The experimenter visited personally and distributed the questionnaires to 32 (twenty two) Headmasters/Headmistress and 192 (one hundred ninety-two) students: 6 (six) students from, each school (3 students of std. IX-th and 3 of std. X-th randomly selected from 32 (Thirty two) secondary schools in the urban area of Amravati district, Maharashtra, and explained the procedure for filling questionnaire to them.

To secure honesty in answering the mentioned questionnaire the
Headmasters/Headmistress and the students were given the liberty of not to sign in the questionnaire Performa so that they may not be identified. They were assured that their answers would be kept confidential and great precautions were taken to ensure that this guarantee of anonymity was understood and respected.

Thus the experimenter could ultimately collect 192 (one hundred and ninety two) questionnaires from 32 (thirty two) Headmasters/Headmistress and 1152 (one thousand one hundred and fifty two) questionnaires from 192 (one hundred and ninety two) students duly filled before and after 24 weeks treatment program. The information was collected from Headmasters/Headmistress (expert's ratings) and students (students rating) for the assessment of teachers teaching effectiveness in the present study.

The experimenter verified each and every questionnaire filled in by the headmasters/headmistress and students. After verification of questionnaires it was found that few headmasters/Headmistress and students did not give opinion regarding some questions. While collecting data experimenter had also taken personal interview from those headmaster/headmistress and students to complete the information’s regarding the questionnaires. Finally, the experimenter collected 192 (one hundred and ninety two) questionnaires (before treatment 96 and after treatment 96 questionnaires) from 32 (thirty two) Headmaster/ Headmistress and 1152 (one thousand one hundred and fifty two) questionnaire (before training 576 and after training 576 questionnaires) from 192 (one hundred and ninety two) students, who had given in detail was needed with their opinion correct to the point about questionnaires.

Thus the present experimenter collected the data before and after 20 (twenty four) weeks treatment program for tabulation and further statistical analysis to compare the organic disorders and teaching effectiveness of secondary school teachers of Amravati district, Maharashtra.

3.3 ADMINISTRATIONS OF THE TEST:

**Organic Disorders:**

(1) **Amount of Sugar in blood:**

(a) Equipments: Photo Colorimeter, Test Tube, Disposable Syringe, Centrifuge

(b) Kits: Enzymatic Glucose Kit (GOD-POD)

(c) Description:

The subjects should not take anything after dinner (any food or liquid); they were asked to sit on a chair and not to be afraid at the time of collecting blood. A tourniquet belt was wrapped tightly around the arm above the elbow of the subjects and the subjects were asked to cupped palm of the hand and then by the disposable syringe the blood was collected in the morning that was fasting sample and 1 to 1.5 hours after lunch that was post meal sample, photo colorimeter equipment was used to analyze and to estimate the amount of sugar in blood.

(d) Scoring :

The amount of sugar in blood in fasting and postprandial was counted individually and recorded in mg/dl as the score of the subjects.

(2) Amount of Sugar in Urine:

(a) Equipments : Urine Collection Bottle,

(b) Kit : Dipsticks (Bayer Company)

(c) Description :

The subjects were asked to collect his/her urine in a provided bottle. In fasting and postprandial urine was collected to find out the amount of sugar in urine. With the help of Dipsticks (Bayer Company) presents of sugar in urine was tested. Color change of spot Dipstick was used to compare with color charts (already supplied with bottle) and decided the percentage of sugar in urine.

(d) Scoring :

On the basis of Dipstick color, percentage of sugar in urine decided in the following manner.
(3) **W.B.C. or Leukocytes Count:**

(a) Equipments : Glass Slides, Naubauer Chamber, W.B.C. Pipette.

(b) Kits and Chemicals : W.B.C. Diluting Fluid, Distilled Water, Leishman's Stain, Microscope, Immersion Oil.

(c) Description :

Collected bloods was taken in a small glass bottle containing potassium oxalate as an anticoagulant then close the rubber stopper and shake the bottle very well for mixing the blood. Draw the anticoagulant blood with the help of WBC diluting pipette to exactly the O.S. Mark of the counting pipette. Wipe the tip of the pipette clean with a piece of cotton. After wiping the tip by gentle mouth suctioning, draw the diluting fluid steadily into the pipette to exactly the 101 mark past the bulb. Then pipette was kept horizontally in the grip of two palms and rotates the pipette on its long axis to ensure thoroughly mixing of blood and diluents. Place the special cover ship in its proper position over the ruled areas of the hemocytometer. Shake the pipette, discard the first drop of diluted blood from the pipette, and then another drop of diluted blood carefully and exactly fill the naubauer chamber for W.B.C. Counting.

(d) Scoring :

The total number of leukocyte (WBC) counted in blood cells with the help of counting chamber in per cubic millimeter.

(4) **R.B.C. Or Erythrocytes Count:**

(a) Equipments : Glass Slides, Naubauer Chamber, R.B.C. Pipette.

(b) Kits and Chemicals : R.B.C. Diluting Fluid, Distilled Water, Leishman's Stain,
Microscope and Immersion Oil.

(c) Description :

Collected bloods was taken in a small glass bottle containing potassium oxalate as an anticoagulant then closes the rubber stopper and shake the bottle very well for mixing the blood. Draw the anticoagulant blood with the help of RBC diluting pipette to exactly the O.S. Mark of the counting pipette. Wipe the tip of the pipette clean with a piece of cotton. After wiping the tip by gentle mouth suctioning, draw the diluting fluid steadily into the pipette to exactly the 101 mark past the bulb. Then pipette was kept horizontally in the grip of two palms and rotate the pipette on its long axis to ensure thoroughly mixing of blood and diluents. Place the special cover ship in its proper position over the ruled areas of the hemocytometer. Shake the pipette, discard the first drop of diluted blood from the pipette, and then another drop of diluted blood carefully and exactly fill the naubauer chamber for R.B.C. Counting.

(d) Scoring :

With the help of naubauer chamber and microscope the counted RBC (Erythrocytes) have to be multiplied by 5000 instead of 10,000 and recorded in million per cubic millimeter.

(5) Body Weight:

(a) Equipment : Weighing Machine.

(b) Description :

The body weight of each selected subjects was taken with the help of weighing machine. The subjects were asked to stand on bare foot at the center of the weighing machine.

(c) Scoring :

The total body weight of each subject was read and recorded to the nearest kilogram.

3.4 ADMINISTRATION OF THE TREATMENT PROGRAMME:

The treatment programme consisting of the following yoga exercises were administered progressively and carried over until the end of treatment period of 24 (Twenty four) weeks.

Yoga Exercises:
5. **JANUSHIRASANA:**

1. Sit with the legs outstretched and the feet together. Bend the left leg, placing the heel of the foot against the perineum and the sole of the foot against the inside of the right thigh.

2. Keep the left knee on the floor. Place the hands on top of the right knee, keeping the spine straight and the back muscles relaxed.

3. This is the starting position. Slowly bend forward, sliding the hands down the right leg, and grasp the right foot.

4. If possible and thumb of the left hand and index finger, middle finger and thumb of the left hand and the outside edge of the foot with the right hand.

5. Try to touch the knee with the forehead.

6. This is the final position. Keep the back relaxed and do not strain.

7. Hold the position for as long as is comfortable. Return to the starting position and rests the hands on the knees.

8. Change sides and repeat with the right leg bent and the left leg straight.

9. Practice up to 5 times with each leg.

**Breathing:**

Inhale in the starting position. Exhale while bending forward. Retain the breath outside if holding the final position for a short time. Breathe normally if holding the pose for a longer time. Inhale while returning to the starting position.

6. **ARDHA-MATSEYENDRASANA:**

1. Sit with the legs stretched out in front of the body.
2. Bend the right leg and place the right foot flat on the floor on the outside of the left knee.

3. The toes of the right foot should face forward. Bend the left leg and bring the foot around to the right buttock.

4. The outside edge of the foot should be in contact with the floor. Pass the left arm through the space between the chest and the right knee, and place it against the outside of the right leg.

5. Hold the right foot or ankle with the left hand so that the right knee is close to the left hand so that the right knee is close to the left armpit.

6. Sit up as straight as possible. Raise the right arm in front of the body and gaze at the fingertips.

7. Slowly twist to the right, simultaneously moving the arm, trunk and head.

8. Use the left arm as a lever against the right leg to twist the trunk as far as possible without using the back muscles.

9. Follow the tips of the fingers of the right hand with the gaze and look over the right shoulder.

10. Do not strain the back. Bend the right elbow and place the arm around the back of the waist. The back of the right hand should wrap around the left side of the waist.

11. Alternatively it can be placed as high as possible between the shoulder blades with the fingers pointing up.

12. This arm position enforces the straightness of the spine. Reverse the movements to come out of the posture and repeat on the other side.

**Breathing:**

Inhale in the forward position. Exhale while twisting the trunk. Breathe deeply and slowly without strain in the final position. Inhale while returning to the starting position.

**Duration:**

Practice once on each side gradually increasing the holding time to 1 or 2 minutes on each side of the body or up to 30 breaths.

**Awareness:**

Physical on keeping the spine straight and on the movement of the abdomen created by
the breath in the final position.

**Sequence:**

This asana should be performed after completing a series of forward and backward bending asana.

**Contra-Indications:**

People suffering from peptic ulcer hernia or hyperthyroidism should only practice this pose under the guidance of a competent teacher. People with sciatica or slipped disc should not practice it.

© PURNA-SALBHASANA:

1. Assume the final position of shalabhasana will the legs raised in the air as high as possible.

2. Tense the arm muscles.

3. Keep the arms and shoulders firm contact with the floor to support the body.

4. Lift the legs with a jerk to the vertical position and balance on the shoulders, chin and arms. Once the point of balance is obtained, gradually bend the knees and bring the toes down to touch the head.

5. This is the final position. The final position may sometimes be more easily achieved by rhythmically swinging the legs up to progressively higher levels until the point of balance is reached.

6. Hold the final position for as long as is comfortable.

7. To return to the starting position lift the feet from the head and find the point of balance.

8. Then slowly lower the body to the starting position.

9. Turn the head to one side or practice ad asana and allow the respiration and heartbeat to return to normal.

**Breathing:**

Inhale while in the prone position. Retain the breath inside while raising the body into the final position. Breathe normally in the final position. Retain the breath inside while lowering the body to the prone position.
Precautions:

1. Raise the legs together without jerking.
2. Do not bend the legs at the knees.
3. Try to keep the chin and shoulder touching the floor.
4. Return to the original position gradually.
5. Raise the legs from the floor about nine inches and maintain.
6. Do not do on the uneven place.
7. Do slowly and smoothly.

Duration:

Practice 1 or 2 rounds slowly increasing the length of time in the finals position.

Awareness:

Physical on the abdomen relaxing the back and maintaining balance.

Contra-Indications:

This advanced form of shalabhasana should only be performed by people who are physically fit and who have very supple backs. It should not be practiced by people with a weak heart, coronary thrombosis or high blood pressure, cervical spondylitis or hyperthyroidism. Those suffering from peptic ulcer hernia intestinal tuberculosis and other such conditions are also advised not to practice this asana.

(D) HALASANA:

1. Lie flat on the back with the legs and feet together.
2. Place the arms beside the body with the palms facing down.
3. Relax the whole body.
4. Raise both legs to the vertical position, keeping them straight and together, using only the abdominal muscles.
5. Press down on the arms and lift the buttocks rolling the back away from the floor.

6. Lower the legs over the head. Bring to toes towards the floor behind the head without straining, but do not force the toes to touch the floor.

7. Turn the palms up bend the elbows and place the hands behind the ribcage to support the back, as in sarvangasana.

8. Relax and hold the final pose for as long as is comfortable.

9. Return to the starting position by lowering the arms with the palms facing down, then gradually lower each vertebrae of the spine to the floor, followed by the buttocks so that the legs resume their initial vertical position.

10. Using the abdominal muscles, lower the legs to the starting position keeping the knees straight.

**Breathing:**

Inhale while in the lying position. Retain the breath inside while assuming the final pose. Breathe slowly and deeply in the final pose. Retain the breath inside while returning to the starting position.

**Precaution:**

1. Do the asana on a mat
2. Do not do the asana on the uneven place.
3. It should be done slowly and smoothly.
4. This is done gradually without giving any jerks.
5. In the beginning if one finds difficulty due to stiff spine, remain in the position which is comfortable.
6. The legs may shake and in that case slight bend of the knees is allowed.
7. Do not raise the arms.

**Duration:**

Beginners should hold the pose for 15 seconds, gradually adding a few seconds per week.
until it can be held for one minute. Adepts may hold the final pose up to 10 minutes or longer.

**Awareness:**

Physical on the abdomen relaxation of the back muscles and neck, the respiration or the thyroid.

**Sequence:**

If possible perform this asana immediately after sarvangasana. To move from sarvangasana to halasana, bring the feet slightly over the head for balance, slowly remove the arms from their position behind the back and place them on the floor in the starting position palms facing down. Relax the body and slowly lower the legs over the head keeping them straight and together until the toes touch the floor. Release as described above. Follow halasana with either matsyasana, ushtrasana or sputa vajrasana as a counter pose, practiced for half the combined duration of sarvangasana and halasana. Halasana is a good preparatory practice for paschimottansana.

**Contra-Indications:**

This asana should not be practiced by those who suffer from hernia, slipped disc, sciatica, high blood pressure or any serious back problem especially arthritis of the neck.

**(E) USTRASANA:**

1. Sit in vajrasana. Stand on the knees with the arms at the sides.

2. The knees and feet should be together, but may be separated if this is more comfortable.

3. Lean backward, slowly reaching for the right heel with the right hand and them the left heel with the left hand.

4. Do not strain.

5. Push the hips forward, keeping the thighs vertical and bend the head and spine backward as far as is comfortable.

6. Relax the whole body, especially the back muscles into the stretch.

7. The weight of the body should be evenly supported by the legs and arms.

8. The arms should anchor the shoulders to maintain the arch of the back.
9. Remain in the final position for as long as is comfortable.

10. Return to the starting position by slowly releasing the hands from the heels one at a time.

**Breathing:**

Normal. Do not try to breathe deeply because the chest is already stretched.

**Duration:**

Practice up to 3 times as a dynamic asana. Hold the final position up to 3 minutes as a static pose.

**Awareness:**

Physical on the abdomen throat spine or natural breathing.

**Sequence:**

It is important that this asana is followed by a forward bending asana such as paschimottanasana, to release any tension in the back. The most convenient counter pose is shashankasana since it may be performed immediately from vajrasana without unnecessary body movement.

**Contra-Indications:**

People with severe back ailments such as lumbago should not attempt this asana without the guidance of a competent teacher.

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(F) **DHANURASANA:**

1. Lie flat on the stomach with the legs and feet together and the arms and hands beside the body.

2. Bend the knees and bring the heels close to the buttocks.

3. Clasp the hands around the ankles.

4. Place the chin on the floor.
5. This is the starting position. Tense the leg muscles and pushes the feet away from the body.

6. Arch the back, lifting the thighs, chest and head together.

7. Keep the arms straight.

8. In the final position, the head is tilted back and the abdomen supports the entire body on the floor. The only muscular contraction is in the legs; the back and arms remain relaxed.

9. Hold the final position for as long as is comfortable and then slowly relaxing the leg muscles lower the legs, chest and head to the starting position.

10. Release the pose and relax in the prone position until the respiration returns to normal.

11. This is one round. Practice 3 or up to 5 rounds.

**Breathing:**

Inhale deeply in the starting position. Retain the breath while raising the body. Retain the breath inside in the final position or practice slow, deep breathing so that the body rocks gently in unison with the breath. Exhale while returning to the prone position.

**Precautions:**

1. Practice this asana with empty stomach.

2. Try to rest on the navel.

3. Keep the arms straight.

4. Keep the knees apart in the beginning as one feels comfortable, bring them closer.

5. Avoid jerks in raising and lowering to trunk and the knees.

6. Do the asana slowly and smoothly.

**Awareness:**

Physical on the abdominal region, the back or the rhythmic expansion and contraction of the abdomen to the slow deep breathing.

**Sequence:**
Dhanurasana is ideally practiced after bhujangasana and shalabhasana and should be followed by a forward bending posture. It should not be practiced until at least three or four hours after a meal.

**Contra-Indications:**

People who suffer from a weak heart, high blood pressure, hernia, colitis, peptic or duodenal ulcers should not attempt this practice. This asana should not be practiced before sleep at night as it stimulates the adrenal glands and the sympathetic nervous system.

**(G) BHUJANGASANA:**

1. Lie flat on the stomach with the legs straight feet together and the soles of the feet uppermost.
2. Place the palms of the hands flat on the floor, below and slightly to the side of the shoulders with the finder’s together and pointing forward.
3. Position the arms so that the elbows point backward and are close o the sides of the body.
4. Rest the forehead on the floor and close the eyes.
5. Relax the whole body especially the lower back.
6. Slowly raise the head.
7. Gently tilt the head backward so that the chin points forward and the back of the neck is compressed ten raise the neck and then the shoulders.
8. Straighten the elbows using the back muscles first then the arm muscles to raise the trunk further and arch the back.
9. in the final position the pubic bone remains in contact with the floor and the navel is raised a maximum of 3 cm.
10. If the navel is raised too high the bend tends to be in the knees and not in the back.
11. The arms may or may not be straight this will depend on the flexibility if the back Hold the final position.
12. To return to the starting position slowly release the upper back by bending the arms lower the navel chest shoulders and finally the forehead to the floor.

**Breathing:**
Inhale while raising the torso. Breathe normally in the final position or retain the breath if the pose is held for a short time. Exhale while lowering the torso.

**Duration:**

Practice up to 5 rounds gradually increasing the length of time in the final position.

**Precaution:**

1. Keep the palms close to your body, fingers together and elbows bent and stretched toward to spine.
2. Use hands for minimum support, i.e. place minimal weight on the hands.
3. Trunk should be lifted up to the naval only; if lift beyond, push back down.
4. The whole process of raising the chest and curving the back must be gradual, vertebra by vertebra.
5. Do not raise the feet from the ground when raising the head.
6. Do the asana slowly and smoothly.
7. If the spine is stiff, proceed cautiously, jerk may be painful or even harmful.

**Awareness:**

Physical on the smooth systematic arching movement of the back the stretching of the abdomen and on synchronizing the breath with the movement.

**Sequence:**

This asana gives maximum benefits if preceded or followed by a forward bending asana. It may also be performed in conjunction with shalabhasana and dhanurasana for effective general health of the back and spine.

**Contra-Indications:**

People suffering from peptic ulcer, hernia, intestinal tuberculosis or hyperthyroidism should not practice this asana without the guidance of a competent teacher.

**(H) PASCHIMOTANASANA:**
1. Sit on the floor with the legs outstretched feet together and hands on the knees.

2. This is the starting position. Relax the whole body.

3. Slowly bend forward from the hips sliding the hands down the legs.

4. Try to grasp the big toes with the fingers and thumbs. If this is impossible, hold the heels ankles or any part of the legs that can be reached comfortably.

5. Move slowly without forcing or jerking.

6. Hold the position for a few seconds.

7. Relax the back and leg muscles allowing them to gently stretch.

8. Keeping the legs straight and utilizing the arm muscles, not the back muscles begin to bend the elbows and gently bring the trunk down towards the legs, maintaining a firm grip on the toes feet or legs.

9. Try to touch the knees with the forehead. Do not strain.

10. This is the final position. Hold the position for as long as is comfortable and relax.

11. Slowly return to the starting position. This is one round.

**Breathing:**

Inhale in the starting position. Exhale slowly while bending forward. Inhale in the static position. Exhale while bringing the trunk further towards the legs with the arms. Breathe slowly and deeply in the final position or retain the breath out if holding for a short duration. Inhale while returning to the starting position.

**Duration:**

Beginners should perform up to 5 rounds staying in the final position for only a short length of time. Adepts may maintain the final position for up to 5 minutes.

**Awareness:**

Physical on the abdomen relaxation of the back and leg muscles or the slow breathing process.
Sequence:

This asana should precede or follow backward bending asana such as seta asana, chakrasana, bhujangasana or mats asana.

Contra-Indications:

People who suffer from slipped disc, sciatica or hernia should not practice paschimottanasana.

(I)SARVANGASANA:

1. Lie on the back on a folded blanket.
2. Check that the head and spine are aligned and that the legs are straight with the feet together.
3. Place the hands beside the body with the palms facing down.
4. Relax the entire body and mind.
5. Contract the abdominal muscles and with the support of the arms slowly raise the legs to the vertical position keeping them straight.
6. When the legs are vertical press the arms and hands down on the floor.
7. Slowly and smoothly roll the buttocks and spine off the floor, raising the trunk to a vertical position.
8. Turn the palms of the hands upward bend the elbows and place the hands behind the ribcage, slightly away from the spine to support the back.
9. The elbows should be about shoulder width apart.
10. Gently push the chess forward so that it presses firmly against the chin.
11. In the final position the legs are vertical together and in a straight line with the trunk.
12. The body is supported by the shoulders, nape of the neck and back of the head.
13. The arms provide stability the chest rests against the chin and the feet are relaxed.
14. Close the eyes. Relax the whole body in the final pose for as long as is comfortable.
15. To return to the starting position bring the legs forward until the feet are above and behind
the back of the head.

16. Keep the legs straight. Slowly release the position of the hands and place the arms on the floor beside the body with the palms down.

17. Gradually lower each vertebra to the floor followed by the buttocks so that the legs resume their initial vertical position.

18. Lower the legs to the floor slowly keeping the knees straight.

19. Perform this action without using the arms for support.

20. The whole movement should combine balance with control so that the body contacts the floor slowly and gently.

21. Relax in shavasana until the respiration and heartbeat return to normal.

**Breathing:**

Inhale in the starting position. Retain the breath inside while assuming the final pose. Practice slow, deep abdominal breathing in the final pose. Retain the breath inside while lowering the body to the floor.

**Duration:**

When first practicing, hold the final position for a few seconds only gradually increasing the time over a period of weeks to an optimum of 3 to 5 minutes for general health. This practice should be performed only once during the asana program.

**Precaution:**

1. This asana should not be attempted by those with disorders of the thyroid.

2. People suffering from high blood pressure should not attempt servangasana.

3. Do the asana slowly and smoothly.

4. Avoid any jerk.

**Awareness:**

Physical on the various sensations of the body adjusting to its inversion, on control of the movement, on the neck or thyroid gland and on the breath.
Sequence:

Sarvangasana is ideally practiced immediately before halasana. After halasana, either matsyasana, counter pose for half the combined duration of sarvangasana and halasana.

Contra-Indications:

This asana should not be practiced by people suffering from enlarged thyroid, liver or spleen, cervical spondylitis, slipped disc, high blood pressure or other heart ailments, weak blood. It should be avoided during menstruation and advanced stages of pregnancy.

(J) SHAVASANA:

1. Lie flat on the back with the arms about 15 cm away from the body, palms facing upward.
2. A thin pillow or folded cloth may be paced behind the head to prevent discomfort.
3. Let the finders curl up slightly.
4. Move the feet slightly apart to a comfortable position and close the eyes.
5. The head and spine should be in a straight line.
6. Make sure the head does not fall to one side or the other, Relax the whole body and stop all physical movement.
7. become aware of the natural breath and allow it to become rhythmic and relaxed.
8. After some time, again become aware of the body and surroundings and gently and smoothly release the posture.

Breathing:

Natural and relaxed, or begin to count the breaths from number 27 backwards to zero. Mentally repeat, “I am breathing in 27, I am breathing out 27, I breathing in 26, I am breathing out 26”, and so on, back to zero. If the mind wanders and the next number is forgotten bring it back to the counting and start again at 27. If the mind can be kept on the breath for a few minutes, the body will relax.

Duration:

According to time available. In general the longer the better, although a minute or two is sufficient between asana practices.
**Precautions:**

1. Do not do on the uneven place.
2. Do the asana on a mat.
3. Do slowly and smoothly.
4. Eyes should be closed, unless one is uncomfortable with eyes closed.
5. Pay attention to the flow of your breath.
6. Rest the head wherever it feels comfortable.

**Awareness:**

Physical first on relaxing the whole body then on the breath.

**Practice Note:**

Do not move the body at all during the practice as even the slightest movement disturbs the practice. A personal mantra may be repeated with every inhalation and exhalation. For maximum benefit, this technique should be performed after a hard day’s work, before evening activities or to refresh the body and mind before sitting for meditation, or just before sleep.

Practices were given to the yoga exercise group the prescribed yoga exercises for 6 (six) day a week for 45 (forty five) minutes each day under direct supervision of the experiment. A common weekly off day i.e., Sunday was allowed them for rest. The aforesaid yoga exercises were demonstrated in their presence before they undertook their own practices.

**3.5 EXPERIMENTAL DESIGN:**

The experimental study was made on subjects numbering 96 (ninety six). They were divided in 3 (three) groups on the basis of age, sex, severity of illness and attempts were made to maintain homogeneity in grouping as far as it was possible. The groups were as under:

**Total 96 (ninety six) Subjects:**

<table>
<thead>
<tr>
<th>Group-I</th>
<th>Group-II</th>
<th>Group-III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoga Exercise Group</td>
<td>Control Group</td>
<td>Non-diabetic Group</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Diabetic patient Teacher's consisting 22 male and 10 female</td>
<td>Diabetic patient Teacher's consisting 22 male and 10 female</td>
<td>Non-diabetic patient Teacher's consisting 22 male and 10 female</td>
</tr>
</tbody>
</table>

The time and date of the practices were as under:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday to Saturday</td>
<td>5.15 am to 6.15 am</td>
<td>District Sport Office</td>
</tr>
</tbody>
</table>

Practices were given to the yoga exercise group for 24 (twenty four) weeks excluded the pre and post test. The duration of their practice was 45 (forty five) minutes each day. The practices of the yoga exercises of the subjects were conducted at the district sports office of Amravati district of Maharashtra, in a mentioned room for male and female under direct supervision of the experimenter, but in case of female subjects, my wife helped to conduct the practice and in taking tests and the help of a doctor also was taken in taking tests. Two sets of results and scores obtained at the beginning and at the end of the experiment were compared and scrutinized to see whether any improvement was evident. In so doing the scores were calculated by adopting the methodology for statistical analysis.

3.6 METHODOLOGY FOR STATISTICAL ANALYSIS:

To find out the effect of yoga exercises on organic disorders of the selected subjects, 't' test, (Garrett Henry E. 2006) was adapted and to compare the teaching effectiveness between the groups Chi-square tests (X2) as well as percentage (%) of data were employed to compare the distribution of groups on the basis of criteria of assessment. (Verma J. Prakash, 2010).
To find out the effects of yoga exercises on organic disorders and in teaching effectiveness the data were collected through administering the test and administering questionnaires for the Headmasters/Headmistress (experts rating) and students (students rating) for the objectives of the study.

All the data of organic disorders were tested by applying ‘t’ test to find out significant difference between the initial and final scores of the three groups (yoga exercises, control and non-diabetic group) and to find out the effect of yoga exercises in teaching effectiveness, chi-square (X2) as well as percentage (%) statistics were employed independently.

Formula: \[ t = \frac{(M_1-M_2)}{SE_D} \quad \chi^2 = \frac{(f_0-f_e)^2}{f_e} \]

The following notations were used for all the subsequent tables for elaborations.

Y.E.G – Yoga exercises group, C.G.- Control group, N.D.G.- Non diabetic group, N.- Number of subjects in group, M1- Sample mean for initial scores, M2- Sample mean for final scores, MD- Mean difference between initial and final scores, SD1- Standard deviation of initial scores, SD2- Standard deviation of final scores, ‘t’- ‘t’ value, \( \chi^2 \) - Chi-square, H- Null hypothesis, df- degree of freedom, ‘t’ follows t distribution with (N-1) .05 level of significance.

Since all the groups of male had 22 subjects each, the df in each cases was (22-1) =21 and all groups of female had 10 subjects each, the df in each cases was (10-1) =09.