

CHAPTER III

METHODOLOGY

The Research methodology involves the systematic procedure by which researcher starts from the initial identification of the problem to its final conclusion. The role of the methodology is to carry on the research work in a scientific and valid manner. The purpose of the study was to find out whether there would be any significant influence of Impact of Hatha yoga Sadhana on selected socio environmental and learning disorder syndrome factors among dyslexic primary Children.

This chapter provides an overview of the method used in the study for the selection of subjects, selection of variables, experimental design, and reliability of data, training schedule, training program, collection of data and statistical technique which has been explained in detailed.

3.1 SELECTION OF SUBJECTS

For the present investigation thirty dyslexic primary Children were selected randomly from various places at Bangalore. Totally Twelve weeks training were given on hatha yoga sadhana to the subjects. All the dyslexic primary Children subjects were assigned to two group one is experimental group and one control group each group consists of 20 subjects. Experimental group underwent hatha yoga sadhana, and control group no experimental training was provided during the training period.

3.2 SELECTION OF VARIABLES

The investigator reviewed the available scientific literature pertaining to the study from books, journals, periodicals, magazines, research papers and available sources Tamilnadu Physical Education and Sports University, University of Madras and also with help of professional experts in yoga , the following socio environmental and learning disorder syndrome factors were selected.

3.2.1 SELECTION OF THE DEPENDENT VARIABLES

Dependent Variables

Socio environmental variables

1. General Mental Alertness
2. Emotional Maturity

Learning disorder syndrome

1. Reading & Spelling disorder
- 2 Writing & Motor Skills disorder
- 3 Mathematics & Time Management disorder
- 4 Memory & Cognition disorder
- 5 Hearing & Speech disorder
6. Problems in Behavior

3.2.2 SELECTION OF THE INDEPENDENT VARIABLES

1. Experimental group - Hatha Yoga Sadhana.
2. Control group - No training.

3.3 EXPERIMENTAL DESIGN

The study was formulated as a random group design, consisting of pre and post test. Thirty dyslexic primary Children were randomly selected and divided into two equal groups. The group was assigned as experimental group and control group. The pre test was conducted on all the subjects on selected socio environmental and learning disorder syndrome factors such as General mental alertness, emotional maturity, Reading & Spelling disorder, Writing & Motor Skills disorder, Mathematics & Time Management disorder, memory & Cognition disorder, Hearing & Speech disorder, Problems in Behavior. The experimental group participated in their hatha yoga sadhana for a period of 12 weeks. The post test was calculated on all the selected variables after 12 weeks of the training period.

3.4 PILOT STUDY

A pilot study was conducted to assess and finalize the training programme to ensure the intensity and duration of the training programme were within the limits of the subject's capacity to produce their desired effect. For this purpose, 30 subjects were selected and given hatha yoga sadhana (3 in each group) respectively to determine the intensity and duration of a training session. The calculated intra-class correlation of the pilot shows that there was significant improvement in socio environmental and learning disorder syndrome factors . Based on the response of the subjects in the pilot study and during the training, the investigator adopted the suitable training schedule for the study. The number of repetitions assigned to each subject was tested and it was found that were within the reach of the individual's capacity.

3.5 ORIENTATION OF THE SUBJECTS

The Prior to the test the investigator explained to the subjects about the purpose of the hatha yoga sadhana . The investigator also explained briefly in depth about the effects and benefits of the training to the subjects participating in the study. Commonly used loosening exercises, suryanamaskar, asanas, pranayamas, meditation, relaxation are selected after consulting an expert in hatha yoga sadhana with the co-operation of the subjects. The method and the value of each loosening exercises, suryanamaskar, asanas, pranayamas, meditation, relaxation were explained and performed first by the investigator. The investigator get full co-operation and motivated them to involve completely and execute the training to their extreme level for the maximum output from the subjects.

3.6 CRITERION MEASURES

By glancing the literature and in consultation with professionals and experts the following criterion measures were selected for measuring the variables in this study is presented in the Table III.

TABLE III

CRITERION MEASURES AND TEST INSTRUMENTS USED

VARIABLES	CRITERIAN MEASURES	INSTRUMENT USED
General Mental Alertness	Marks	Dr. R.P. Srivastava (Jabalpur) questionnaire was used to assess the general mental alertness.
Emotional Maturity	Marks	Emotional maturity questionarys (dr. yashvir singh – agra)
Reading & Spelling disorder	Marks	Dyslexia has 37 common characteristics and these common 37 common characteristics have been grouped into six factors by Lalitha Raja R.(2009).
Writing & Motor Skills disorder	Marks	
Mathematics & Time Management disorder	Marks	
Memory & Cognition disorder	Marks	
Hearing & Speech disorder	Marks	
Problems in Behavior	Marks	

3.6 RELIABILITY OF DATA

The reliability of data was ensured by establishing the instrument reliability, tester reliability, test competency and sujet's reliability.

3.6.1 TESTERS RELIABILITY

To ensure the tester's competency and reliability of the tests the investigator had a number of practice sessions in the teaching procedure and well versed in the technique of

conducting the test. All the measurements were taken by the investigator with the assistance of person well acquainted with their procedures. Reliability of test were established by test, retest process.

3.6.2 TESTERS COMPETENCY

Reliability was established by the test-retest processes. Thirty dyslexic primary Children from all the two groups were tested on selected variables. The repeated measurement of individuals on the same test is done to determine reliability.

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

INTRA CLASS CORRELATION COEFFICIENT OF TEST – RETEST SCORES

S.No	Variables	Coefficient of Correlation
1	Preliminary Questionnaire	0.87*
2	Detailed Questionnaire	0.86*

Significant at 0.01 level

As for socio environmental and learning disorder syndrome factors such as General mental alertness, emotional maturity, Reading & Spelling disorder, Writing & Motor Skills disorder, Mathematics & Time Management disorder, memory & Cognition disorder, Hearing & Speech disorder, Problems in Behavior., the authors of the questionnaire have determined reliability and the same was adapted for this study and considered as reliable.

3.6.3 SUBJECTS RELIABILITY

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

3.7 TRAINING SCHEDULE

The training schedule prescribed was applied to experimental groups, the duration of the training was 12 weeks, 5 sessions were conducted in each week, each session in 1st quarter period (from 1st to 4th weeks) was 90 minutes duration, 2nd quarter period (from 5th to 8th weeks) was 105 minutes duration and 3rd quarter period (from 9th to 12th weeks) was 120 minutes duration. The training schedule of dyslexic children took longer duration due to their slow response and seeks of individual attention of the teacher and trainees than normal

children. The practices were initially given simple manner and then gradually increased to get the optimum level based on capability of the individual. Duration of each technique and repetition are performed depends upon the individual health condition.

Table - II
HATHA YOGA SADHANA SCHEDULE FOR FIRST QUARTER PERIOD

(From 1st to 4th weeks)

S.N O	NAME OF THE PRACTISE	FREQUE NCY	DURATIO N OF PRACTIC E (minutes)	RES T	REPITIT ION	TOTAL DURAT ION (minutes)
1	Prayer	5	2	-	1	2
2	Preliminary practice	5	10	5	5	15
3	Loosening exercises	5	10	5	-	15
4	Surya Namaskar	5	10	5	3	15
5	Tadasana	5	2	-	2	02
6	Vajrasana	5	2	-	2	02
7	Sasankasana	5	2	3	2	05
8	Padmasana	5	3	-	2	03
9	Badakonasana	5	2	-	2	02
10	Bhujangasana	5	2	3	2	05
11	Simasana	5	5	3	5	08
12	Bramari pranayama	5	5	3	5	08
13	Japa meditation	5	10	-	-	10
14	Shavasana	5	10	-	-	10
15	Prayer	5	2	-	1	2
	Total					90

Table - III
HATHA YOGA SADHANA SCHEDULE FOR SECOND QUARTER PERIOD (From 5th
to 8th weeks)

S.NO	NAME OF THE PRACTISE	FREQUENCY	DURATION OF PRACTICE (minutes)	REST	REPITITION	TOTAL DURATION (minutes)
1	Prayer	5	2	-	1	2
2	Preliminary practice	5	10	5	5	15
3	Loosening exercises	5	10	5	-	15
4	Surya Namaskar	5	15	5	6	20
5	Tadasana	5	2	-	2	02
6	Vajrasana	5	2	-	2	02
7	Sasankasana	5	2	3	2	05
8	Padmasana	5	3	-	2	03
9	Badhakonasana	5	2	-	2	02
10	Bhujangasana	5	2	3	2	05
11	Simasana	5	7	3	8	10
12	Bramari pranayama	5	8	3	8	11
13	Japa meditation	5	15	-	-	15
14	Shavasana	5	10	-	-	10
15	Prayer	5	2	-	1	2
	Total					105

Table - IV
HATHA YOGA SADHANA SCHEDULE FOR THIRD QUARTER PERIOD

(From 9th to 12th weeks)

S.N O	NAME OF THE PRACTISE	FREQUE NCY	DURATIO N OF PRACTIC E (minutes)	RES T	REPITIT ION	TOTAL DURAT ION (minutes)
1	Prayer	5	2	-	1	2
2	Preliminary practice	5	10	5	5	15
3	Loosening exercises	5	10	5	-	15
4	Surya Namaskar	5	20	5	9	25
5	Tadasana	5	2	-	2	02
6	Vajrasana	5	2	-	2	02
7	Sasankasana	5	2	3	2	05
8	Padmasana	5	3	-	2	03
9	Badhakonasana	5	2	-	2	02
10	Bhujangasana	5	2	3	2	05
11	Simasana	5	7	3	8	10
12	Bramari pranayama	5	10	3	10	13
13	Japa meditation	5	20	-	-	20
14	Shavasana	5	10	-	-	10
15	Prayer	5	2	-	1	2
	Total					120

3.8 YOGIC PRACTICES

LOOSENING EXERCISES

(i). JOGGING

Procedure

- Stand erect and place the fists on the chest start skipping on the toes and touching the heels at the back relieved way.
- Switch over to the jogging by raising the knees to the chest level.
- Continue the practice with side jogging by spreading the legs side wards.

(ii). MUKHA DHOUTI

Procedure

- Stand with slight forward bend of trunk, palms on the thighs and legs about a meter apart.
- Inhale deeply and expel the air forcibly.

(iii). LOOSENING OF ANKLE JOINTS

Procedure

- Stand erect.
- Stretch up the both hands as well as the heels,
- Stand on the toes.
- Bring down the hands.

(iv). LOOSINING OF HIP JOINTS

Procedure

Stand erect and inhale with knees far apart, but heels almost touching each other sit down while exhaling.

- Balance on the toes and sit on the heels.

- Try to push the knees apart by the palms.
- Slowly get up.

(v). PADA SANCALASANA

Procedure

- Stand erect but relaxed.
- Bring the right leg forward without bending the knee, stay in the position for few seconds and relax.
- Bring the right leg backward without bending the knee, stay in the position for few seconds and relax.
- Bring the right leg sideward to right side without bending knee, stay in the position for few seconds and relax.
- Bring the right leg sideward to left side without bending knee, stay in the position for few seconds and relax.
- Repeat complete set of movements in left legs.

(vi). FRONT AND BACK BENDING

Procedure

- Stretch up the hands and bend backward.
- Return in recital position and bad formed try to touch the around it possible.

(vii). SIDE BENDING

Procedure

- Keep the legs apart.
- Raise the both hand sideways up to shoulder level.
- Bend towards right side till the right-hand touch the right knee.

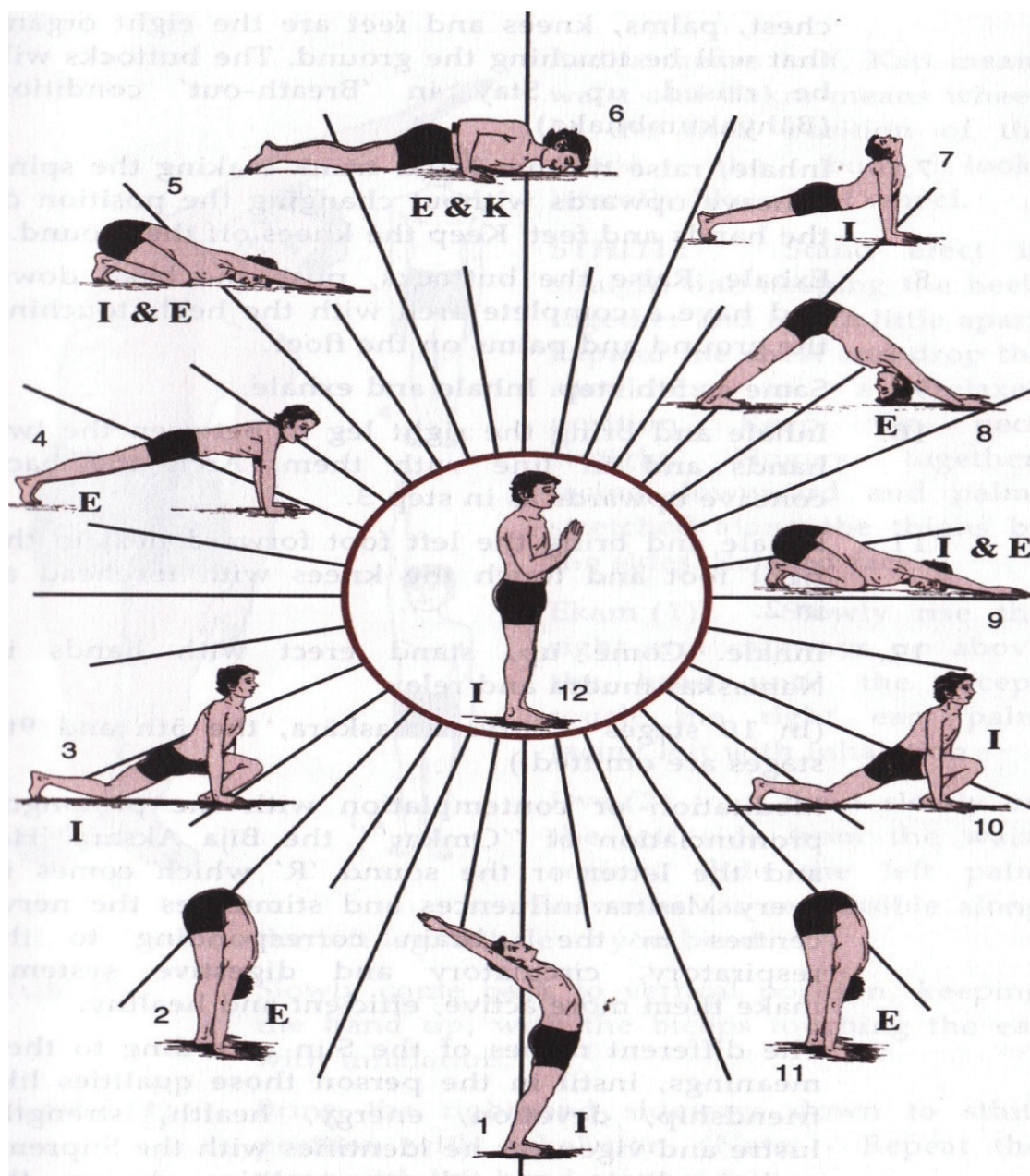
- Come to straight.
- Bend to the left side till the left-hand touch the left knee.

(viii). ROTATION FOR SHOULDER JOINTS

Procedure

- Stand erect and place the palms on the shoulder.
- Rotate the shoulder backward few times forward few times and relax. (**Yoga –**

p.7)SURYA NAMASKAR



Procedure

Position – Standing straight and joining palms in front of the chest.

Step-1- Stretching hand up and bending backward.

Step-2 - Bending forward and touching the toes.

Step-3 - Pushing right leg backward.

Step-4 - Pushing left foot also backward,

Step-5 - Draping knees down and resting hip on heels.

Step-6 - Lying down without draping stomach down.

Step-7- Draping stomach down raising head up chest up.

Step-8 -Raising hip and knees up and pulling head into the hands, triangle shape.

Step-9 - Draping knees down resting hip on heels.

Step-10 - Bringing right foot forward fixing the foot between the palms.

Step-11- Bringing the left foot forward and raising the hip up and touching the toes.

Step-12- Raising upper body up with stretched hand up.

Relax hands down and feet apart

Advantages

- It gives combined benefits of asana.
 - Step-3 and 10 give good exercise to the Spleen and Liver.
- The other poses exercises Lungs, Intestines and kidneys.
- By regular practice of Surya namaskar the body will be always active and functions of the organs will improve.
- It is beneficial in the cases of Bronchial asthma, Diabetic mellitus, initial stage of Arthritis, Irregular menstruation and Constipation. It also improves vitality.
- Steps up the Cardiac activity and the flow of blood throughout the body.
- Warms the extremities and tones up the Nervous system.

- Regulates function of sympathetic and parasympathetic nervous system and helps to promote sleep and makes the mind tranquil.

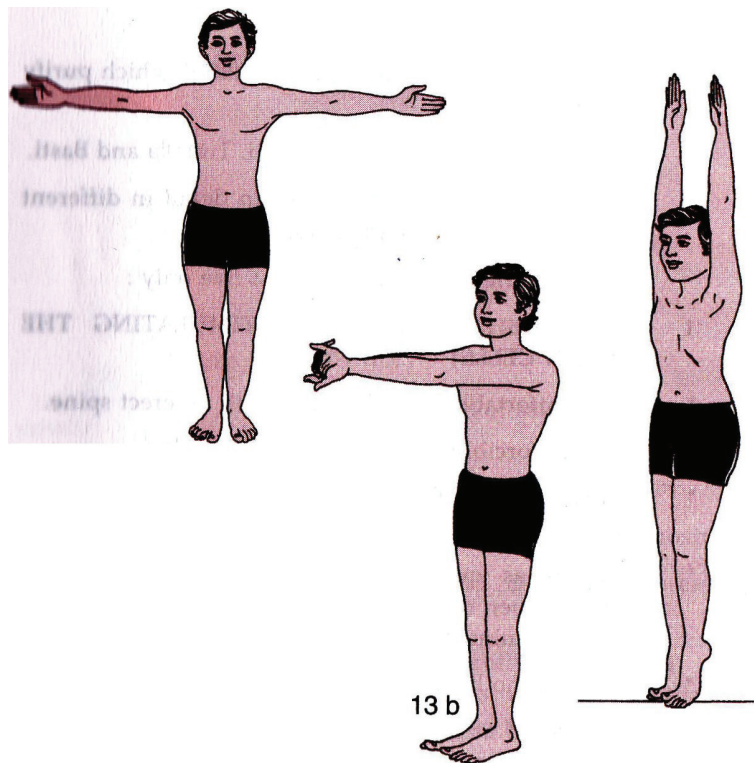
Limitation

1. Should not practice by patients of, severe Lumbar spondylosis, Inflamed joints, Hypertension, Cardiac disorders, Ulcer, Vertigo, Hernia, Renal disorder.

(Yoga for health – p.32)

TADASANA

Palm tree posture



Procedure;

- Keep the feet apart at shoulder width
- Raise the palms up to shoulder level palms facing each other.
- Raise the arms upwards, fingers pointing towards the sky, biceps touching the ear elbows straight.

- Stretch the hands up towards the sky and raise the heels up from the floor balance the body on toes. Keep the toes stretched.
- Slowly drop the heels down as well as hands.

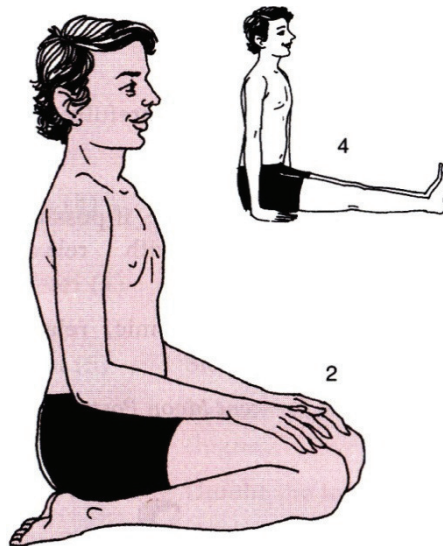
Advantages

- Strengths the leg muscles and ankle joints.
- Develops sense of balance.
- Develops concentration
- Helpful in relieving pressure in between spinal bones.
- Helpful in increasing height. (Happy yoga – p-11)

Limitation

2. Should avoid those who have weak ankle joints.

VAJRASANA



Vajra means diamond signifies strength and vigor.

Procedure

- Sit erect with stretched legs forward.
- Fold the right leg at the knee and place the heel under the right buttocks

- Knees must be together and rest palms on the upper thighs.
- Gently unfold legs one by one, sit erect with stretched legs.

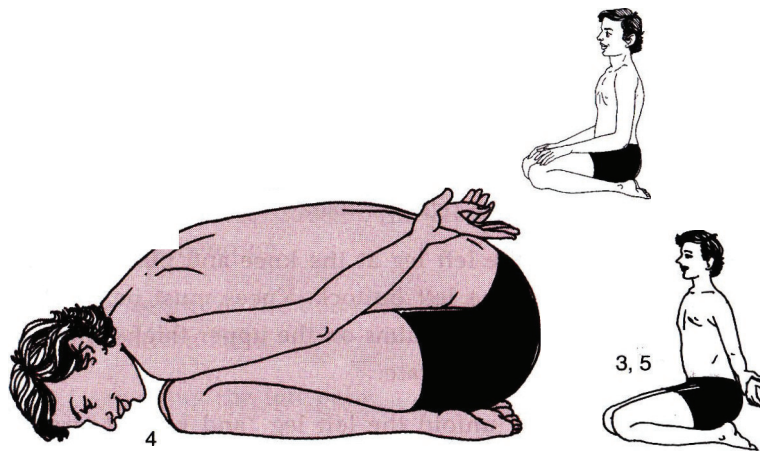
Advantages

- Loosens the joints and muscles of the legs.
- Increases balanced circulation to the lower abdominal region.
- Extremely good for Hyper tension, sciatica and Gastro intestinal disorders.

Limitation

3. Severe **Arthritis** should do carefully. (**Yoga – 41**).

SASANKASANA



The Rabbit or the Crescent moon posture.

Procedure

- Sit erect with legs stretched forwards.
- Slowly bend the right leg, and keep the right heel under the right buttocks.
- Bend the left leg and keep the left heel under left buttocks.

- Spine erect, the head shoulder and buttocks in vertical line, rest the palms on the knees respectively.
- Catch the right wrist with left palm behind the back.
- Bend forward function wise, rest the forehead on the floor in front of the knees.
- Slowly raise the head and chest up.
- Release the hands and keep the palms on the thighs.
- Unfold the legs one by one. Sit erect with legs stretched forward.

Advantages

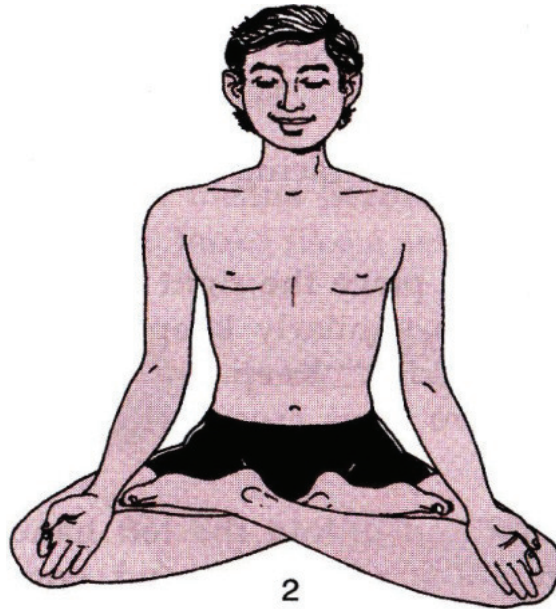
- Improves blood circulation in all abdominal organs, vitalizes pelvis and nerves of the lower back. Helps in seminal weaknesses.
- Whole body gets released and the sensitivity can be felt throughout.

PADMASANA

Lotus posture

Procedure

- Sit erect with legs stretched forward.
- Fold the right knee and place the right foot on left thigh.
- Fold the left knee and place the left foot on right thigh.
- Place the palms on knees and adopt chin mudra.
- Relax the hands and unfold the legs one by one and sit erect with legs stretched.



Advantages

Maintains **balanced flow of energy** throughout the body.

Limitation

Severe **Arthritis** patients should do carefully. (**Yoga – 52**).

BADHAKONASANA

Procedure

From leg extended position slowly bend the right leg at the knee and place the heel close to the groin.

Bend the left leg at the knee and place the soles of the feet together and catch the both feet with the hands. Keep the back straight.

Advantages

Helps to release restrictions in the lower spine, thus helping it to elongate.

Helpful to train the hip muscles for meditation.

Helpful in correcting irregular menstruation.

Prevents hernia.

Helpful during the period of pregnancy for the purpose of smooth delivery.

Helps in keeping the kidney and prostate gland healthy.

Helpful in reducing sciatica pain.

Limitation

Those who have severe knee pain should not perform this.

BHUJANGASANA

Cobra posture

Procedure

- Lie down on the stomach legs together, arms close to the body, palms facing upward.
- Flex the arms at the elbows and place the palm under the shoulder, elbows pointing upward. Place the chin on ground and face as forward as possible.
- Raise the chin then the chest up from the floor. Raise the upper part of the body up to the navel region off the floor.
- Drop the navel, chest, and chin, and place the palms under the chin and relax.

Advantages

- Provides relief from back pain.
- Useful in providing relief for persons suffering from Bronchitis, Asthma, Cervical Spondylitis.
- The posture stimulates the Adrenal gland situated above the kidney, sending a rich supply of blood to this region. This posture is also helpful developing heat in body.
- This posture adjust displacement of the spinal column and tons up sympathetic nerves.

Limitation

- People suffering from Peptic ulcer, Hernia, Intestinal tuberculosis, and Hyperthyroidism can avoid this asana. (**Happy yoga-p.27**)

SIMHASANA

Simha – lion

Lion roaring.

Procedure

- Sit on the floor with legs stretched forward.
- Bend the right knee and place the right foot under the right buttocks.
- Bend the left knee and place the left foot under the left buttocks,
- Sit on heels toes pointing back.
- Place the palms on the knees respectively.
- Stretch the arms straight and keep them stiff.
- Spread the fingers and press them against the knees.
- Open the jaws wide and stretch the tongue out towards the chin as far as you can.
- Roar like lion as loud as you can.
- Withdraw the tongue into mouth lift the hands from the knees and straighten the legs.

Advantages

1. Cures foul breath, and cleans tongue.
2. After continued practice speech becomes clear so this asana is recommended to Stammering.

Limitation

Should avoid ulcer patients.

BRAMARI PRANAYAMA**Procedure**

Inhalation: Through both nostrils producing a sound resembling the 'hum' of a male bee.

Retention: Hold the breath inside.

Exhalation: Through both nostrils producing a sound resembling the female bee.

Advantages

1. Relieves stress and Insomnia
2. Develops Concentration
3. Reduces Blood pressure

Limitation

Should not be performed by those who have Heart disease, Ear infections.

JAPA MEDITATION**Procedure**

1. Sit in Padmasana, Vajrasana or Sukasana
2. Select any Mantra or 'OM'
3. Eyes closed
4. The Mantra has to be repeated neither too slowly or too fast

Four stages

1. Baikhari (auditable) for beginners
2. Upansa (Whispering) lip movement but almost no sound
3. Manasik(Mental) meditating on mental vibration

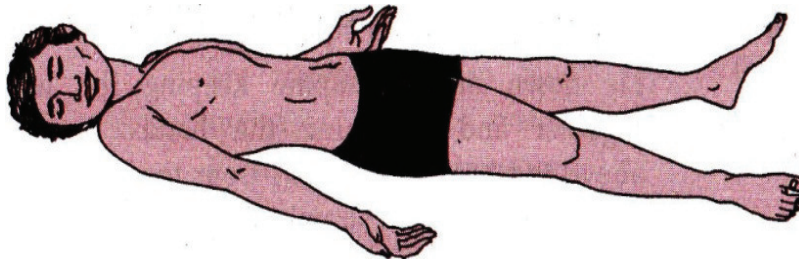
Using Tulsi mala

Use only the middle finger and thumb of the right hand for rolling the beads. The right hand with mala either rest on the right knee with the mala placed on the floor in front of the knee or else the right hand can be held in front of the center of the chest.(Likhit 1982).

Advantages

1. Enables to gain control over the mind, purify it, masters concentration eventually have divine vision.
2. A spiritual aspirant can realize divinity by repetition of a mantra –Patanjali

SHAVASANA (Corpse posture)



Procedure

1. Lying supine in the manner of a dead body
2. Bring legs apart, hands away from the body, palms facing upward, fingers relaxed.
3. Leave the joints loosely and close the eyes and observe the breathe.

Advantages

1. Helpful in reducing High blood pressure.
2. Helpful in reducing Stress.
3. Helpful in providing relief for patients suffering from Insomnia
4. Strengthens and tones up entire system.
5. All the muscles and joints get relaxed.

3.10.1 EMOTIONAL MATURITY SCALE (EMS)

Purpose :

Emotional maturity is not only the effective determinant of personality pattern but it also helps to control the growth of adolescent's development. The concept "mature" emotional behavior of any level is that which reflects the fruits of normal emotional development. A person who is able to keep his emotions under control, who is able to broke delay and to suffer without self-pity, might still be emotionally stunned and childish.

Procedure:

1. Emotional stability.
2. Emotional progression .
3. Social adjustment.
4. Personality integration.
5. Independence.

Test

Given questioners forty eight, tick what they want to say.

Quartile deviations of scores for N = 60.

Sr.no	areas	r.value
A	emotional stability	.75
B	emotional progression	.63
C	social adjustment	.58
D	personality integration	.86
E	independence	.42

Scores	Interpretation
50-80	extremely emotionally mature
81-88	moderately emotionally mature
89-106	emotionally immature
107-240	extremely emotionally immature

3.10.2. GENERAL MENTAL ALERTNESS

Purpose :- To assess the general mental alertness level of the subjects

Equipment :- Dr. R.P. Srivastava (Jabalpur) questionnaire was used to assess the general mental alertness.

Procedure :- Questionnaire describing 100 events which causes general mental alertness was given to the subjects and they were asked to fill along with the level of mental alertness.

Scoring :-

Sl.No	Basis of Classification	Raw Scores	Classification	Grade
1	M+ 4PE and above	84 and above	Excellent	A
2	M+ 3PE and M+ 4PE	75 - 83	Very superior	B
3	M+ 2PE and M+ 3PE	66 - 74	Superior	C
4	M+ 1PE and M+ 2PE	57 - 65	Above average	D
5	M-1PE and M+ 1PE	40 - 56	Average	E
6	M- 1PE and M- 2PE	31 - 39	Below Average	F
7	M - 2PE and M- 3PE	22 - 30	Inferior	G
8	M- 3PE and M- 4PE	13 - 21	Very inferior	H
9	M+ 4PE and above	12 and above	Poorest	I

3.11. LEARNING DISORDER SYNDROME

A standardized questionnaire consisting of 30 statements were administered to analyse the status of with symptoms of primary dyslexic children from Bangalore..

All the statements consist of eliciting “Yes” or “No”. Each yes statement is scored with one point and for “No” there was no point or “0”.

The statements were aimed at eliciting problems in six different factors and the statement numbers through which these factors were analyzed are presented in Table V

TABLE V

FACTORS OF PROBLEMS AND QUESTION Nos. AND SCORES

S.No	Problems In	Question Nos	Total Score
1	Reading & Spelling	1,20,24,25	4
2	Writing & Motor Skills	13,14,15,16,18	5
3	Mathematics & Time Management	9,10,12,22,26	5
4	Memory& Cognition	4,7,8,23,27	5
5	Hearing & Speech	11,17,19,29	4
6	Behavior	5,28,30,2,3,6,21	7

COLLECTION OF DATA

To achieve the purpose of the study two groups consisting of 15 subjects each were selected at random, the first experimental group were treated with hatha yoga sadhana for about twelve weeks (5 days/week). After the training period all subjects were tested on selected criterion variables at different levels as pre and post training.

The pre and post test data on the selected criterion variables were collected by administering the test as per the standardized procedures before and after the twelve weeks of the training programme. Similarly the blood sample was collected from individuals

3.13 STATISTICAL TECHNIQUE

The data obtained were analyzed by Analysis of Covariance (ANCOVA) to assess the significant difference among the groups between the pre test and post test on socio environmental and learning disorder syndrome factors to find out the effect of Hatha yoga sadhana on selected socio environmental and learning disorder syndrome among primary dyslexic children. The normality of the data collected was tested through (ANCOVA). The data and the regression were plotted and found to be in the standing straight line and thus tested for normality of data and found the data are normal.

The investigator has analyzed scientific results obtained by application of various methodologies discussed above and the results are analyzed and presented in form of detailed discussion graphs and various tables in the next chapter.