Research Methodology

CHAPTER III

RESEARCH METHODOLOGY

In this chapter the selection of subjects, selection of variables, pilot study, criterion measures, selection of test, reliability of data, reliability of subject, reliability of test, reliability of instrumental, test administration, orientation of subjects, experimental design, training program, collection of data, and the statistical technique used to analyze the data have been described.

3.1 RESEARCH DESIGN

The purpose of the study was to find out the effect of varied dance fitness programme with yoga on selected cardio-pulmonary, physical fitness and psychological variables among obese school girls. For this study, eighty subjects were selected and divided into four equal groups consisting of twenty each. Experimental Group underwent respective training whereas control group not engaged with any training for the period of twelve weeks. Pre-post test was conducted before and after the training period from the four groups and was statistically analyzed to find out the significant improvement if any due to the training of selected variables among the selected subjects.

3.2 SELECTION OF SUBJECTS

The body mass index data test was administered on one thousand school girls at the age group of 14 - 18 years from Sri Sarada Vidhyalaya Girls Higher Secondary School, Holy Angels Girls Higher Secondary School and St. Joseph Girls Higher Secondary School in Salem District. Further, eighty girls who fallen in overweight and

obese category according to the data of the body mass index score were selected as subjects for the study using purposive sampling method. The selected subjects were then divided into four equal groups consisting of twenty subjects in each in simple random method. These four groups were named as Experimental Group I (n=20) whom underwent high intensity aerobic dance with yoga training, Experimental Group II (n=20) whom underwent low intensity aerobic dance with yoga training, Experimental Group III (n=20) whom underwent zumba dance with yoga training for a period of twelve weeks and the Group IV acted as control group whom were not engaged with any training for a period of twelve weeks.

3.3 SELECTION OF VARIABLES

The research scholar reviewed the available scientific literature pertaining to the problem understanding from books, journals, magazines, research papers and also falling into considerations the feasibility of criteria and availability of instruments the following variables were selected.

3.3.1 DEPENDENT VARIABLE

3.3.1.1 Cardio-pulmonary variables

1. VO$_2$ Max

2. Breath Holding Time

3. Resting Heart Rate

4. Vital Capacity

3.3.1.2 Physical fitness variables

1. Body Composition

2. Flexibility

3. Muscular Strength

4. Cardio Respiratory Endurance

3.3.1.3 Psychological variables

1. Stress

2. Anxiety

3. Achievement Motivation

4. Self- Concept

3.3.2 INDEPENDENT VARIABLE

1. High Intensity Aerobic Dance with Yoga Training

2. Low Intensity Aerobic Dance with Yoga Training

3. Zumba Dance with Yoga Training

3.4 SELECTION OF TEST AND CRITERION MEASURES

TABLE 3.1

S. No.	Criterion Variables	Test Items	Unit of Measurements	Reference
1	VO$_2$ Max	20m Multistage Fitness Test	ml/kg/min	(Reiman and Manske, 2009).
2	Breath Holding Time	Breath Holding test	In seconds	Clarke and Clarke, 1970
3	Resting Heart Rate	Pulse Rate per min During Rest	bpm	Maud and Foster, 2006
4	Vital Capacity	Spiro meter test	In Liters/Seconds	Clarke, 1976
5	Body Composition	Skinfold Caliber	In millimeters	Siri's (1956)
6	Flexibility	Sit and Reach test	In Centimeters	George and Pamela, 1987
7	Muscular Strength	Modified Situps	In Counts	Mathews, 2011
8	Cardio Respiratory Endurance	Coopers 9 Minutes run/walk test	In Meters	Cooper, 1968
9	Stress	Questionnaire	Scores	Everly and Giordano's Stress Scale (1979)
10	Anxiety	Questionnaire	Scores	Marten's Sports Competition Anxiety Test (1977)
11	Achievement Motivation	Questionnaire	Scores	Kamlesh's Achievement Motivation Inventory (1982)
12	Self-concept	Questionnaire	Scores	Mukta Rani Rastogi's test (1980)

3.5 RELIABILITY OF DATA

All the dependent variables selected in the present study were tested twice by the same personnel under similar conditions. The reliability of data was ensured by establishing the instruments reliability, tester's competency and subjects' reliability.

3.6 TESTER'S RELIABILITY

To ensure that the investigator was well versed in the technique of conducting the test, he had undergone a number of practice sessions in the teaching procedure. All the measurements were taken by the investigator with the assistance of person well-acquainted with tests and their procedures. Tester competency and reliability of tests were established by test-retest process.

TABLE 3.2

INTRA CLASS CORRELATION CO-EFFICIENT OBTAINED FOR

TEST – RE TEST SCORE

S .No	Variables	Correlation Co-Efficient
Cardio-pulmonary variables		
1	VO_2 Max	0.97
2	Breath holding time	0.96
3	Resting heart rate	0.95
4	Vital capacity	0.93
Physical fitness variables		
5	Body composition	0.93
6	Flexibility	0.94
7	Muscular strength	0.95
8	Cardio respiratory endurance	0.93
Psychological variables		
9	Stress	0.98
10	Anxiety	0.97
11	Achievement motivation	0.96
12	Self-concept	0.95

3.7 SUBJECT'S RELIABILITY

The subjects were used similar conditions by the same tester and no motivational techniques or any other training were given to the subjects.

3.8 INSTRUMENT RELIABILITY

Instrument such as stop watch, measuring tape, cones were used in the study. All the instruments were used for measuring preferred variables were in good condition. The instruments were available in the Sri Sarada Higher Secondary School, Salem. These instruments were procured from reputed firm and they were new and standardized.

3.9 ORIENTATION OF SUBJECTS

Before collection of data, the subjects were oriented about the purpose of the study. The investigator explained the training and test procedure for assessing cardio-pulmonary variables such as VO_2 max, breath holding time, resting heart rate and vital capacity, physical variables such as body composition, flexibility, muscular strength and cardio respiratory endurance and psychological variables such as stress, anxiety, achievement motivation and self-concept.

3.10 COLLECTION OF DATA

The test was conducted on selected physical fitness (body composition, flexibility, muscular strength endurance and cardio respiratory endurance), selected physiological variables (VO_2 max, breath holding time, resting heart rate and vital capacity) and psychological variables (stress, anxiety, achievement motivation and

self-concept). All the groups were tested before the treatment and the score was recorded with their respective units as pre-test scores. On completion of pre-test, they were treated with the respective training programme for a period of twelve weeks. At the end of the twelve weeks, all the subjects belonging to the various treatments the three groups were tested again on selected variables. It was considered as post test score. The collected data were processed with appropriate statistical techniques.

3.11 ADMINISTRATION OF TEST

3.11.1 VO$_2$ MAX – 20 METER MULTISTAGE FITNESS TEST

Purpose

The 20m multistage fitness test otherwise known as the 20 meter shuttle run test or bleep test or beep test or yo-yo test is nowadays a very common test for VO$_2$ max. The purpose was to find out the aerobic fitness, specifically an estimate of maximal oxygen intake.

Equipments

Measuring tape, CD player, pre-recorded 20m multi stage fitness beeps audio CD, amplifier, cones and score sheets.

Procedure

This test involved continuous running between two lines of 20m apart in synchronization with the emitted beep sound (ran when the tape beeps, not before or after) structured into 21 levels, with each level had multiple beeps played by the CD player. The level-one started with triple beep after the five seconds countdown and each level continued in the same way. The time between recorded beeps decreased at each level. As the test progressed in levels the beeps become progressively faster at every minute, which had the effect of increasing the speed and as such the subjects increased their pace. The test ended when a subject missed three consecutive beeps. The VO_2 max score was then converted from the last shuttle number completed (**Reiman and Manske, 2009**).

Scoring

The subject's raw score was the number of levels and shuttles. The raw score was then converted into VO_2 max equivalent score of milliliters of oxygen per kilogram of body weight per minute (ml/kg/min). The conversion was done by using the calculator downloaded through online.

3.11.2 BREATH HOLDING TIME - BREATH HOLDING TEST

Purpose

To measure the breath holding capacity after a normal inhalation.

Equipment

A chair, stop watch and score sheet.

Procedure

The subjects were instructed to stand at ease and to inhale deeply after holding the breath for a length of time possible. A nose clip was placed on the nose to avoid letting the air through nostrils. The subjects closed their nostrils with nose clip and held the breath after a normal inhalation. The scholar started the stop watch. The breath holding was done as far as possible by each subject. When the subject was started exhaling the investigator stopped the stop watch. The duration from the time of holding breath until the moment the air was out let checked by using the stop watch to the nearest one tenth of a second as the breath holding time. Three trials were given.

Scoring

Out of three trials the best one was recorded as the score. The cooperation of the subject not to let out the air by opening the mouth was sought to clap the exact breath holding time, and the score was recorded in seconds **(Clarke and Clarke, 1970).**

3.11.3 RESTING HEART RATE - PULSE RATE PER MIN DURING REST TEST

Purpose

The purpose was to measure the frequency of heart's beat.

Equipment

Stethoscope

Procedure

The measurement of the resting heart rate was recorded in the early morning using a stethoscope. The subject was asked to sit on a chair and then to relax. The investigator positioned the stethoscope in the ears with the earpieces pointing forward. The diaphragm of the stethoscope was placed over the second inter-costal space on the left hand side. The resting pulse was determined using a 30-second count and the first beat was counted as "zero". Reading was taken for three consecutive days to record the reliable data **(Jenson and Hirst, 1980).**

Scoring

The total number of beats in the 30-seconds count was then multiplied by 2 and recorded in beats/minute (bpm).

3.11.4 VITAL CAPACITY - SPIRO METER TEST

Purpose

To find out the maximum quantity of air that can be expired after a full inhalation.

Equipment

A wet spiro-meter, mouth piece, score sheet and nose clip.

Procedure

Vital capacity was measured by means of a wet spiro-meter. The spiro-meter was filled with water up to one inch from the top and placed at a height where by all subjects can stand erect at the beginning of the test. The subjects were asked to take the fullest possible inhalation and expel all the possible air slowly and steadily into the spiro-meter. Care was taken to prevent the escaping of air through the nose by using nose clip. The point of the indicator at the top of the drum indicated the volume of air expelled in cubic centimeter. It was necessary to note that the subjects did not take a second breath during the test.

Scoring

The vital capacity of each subject was recorded in milli litres. Out of three trials the best one was recorded as the score **(Clarke, 1976).**

3.11.5 BODY COMPOSITION - SKINFOLD TEST

Purpose

To estimate body fat level by the measurement of skinfold thickness

Equipment

Skinfold calipers, tape measure, marker pen, recording sheets.

Procedure

The skin-folds measurement was used to assess estimated body composition or more specifically the level of fatness in an individual. The skin-folds in the present investigation were measured with "Slim Guide skin-folds Caliper" and the instruction manual for this purpose by Donoghue (1987) was followed. The tester pinches the skin at the appropriate site to raise a double layer of skin and the underlying adipose tissue, but not the muscle. The calipers are then applied 1 cm below and at right angles to the pinch and a reading in millimeters (mm) taken two seconds later. The three measurements was taken and the median value was taken. The following are the detailed explanation of test taken in various parts of the body.

Biceps:

The subject was asked to let the arm hang freely and the skin-folds were lifted over the biceps muscles.

Triceps:

The subject was asked to flex the arm at the elbow to 90°. The skin-folds measurement was taken over the triceps muscles.

Subscapular

Measurement was made at the fold diagonally from the vertebral column upward the inferior angle of the right scapula, approximately 2 cm below the inferior angle and slightly towards the midline of the body.

Suprailiac

The site was located immediate above the crest of the left ileum. The thumb was placed over the iliac and the fold lifted medial to the midline at a slight angle to the vertical along the normal fold line.

Scoring

Once density has been estimated, the percentage of fat is calculated on the known differences in density of fat and lean tissue. **Siri's (1956)** equation was used for converting body density to percentage of fat.

Estimated Body Density: 1.1620 - 0.630 Kg x Log of the sum of the four

skin-folds (Biceps + Triceps + Supra-iliac + Sub-scapular)

Estimated body fat percentage = {(4.950/Density) - 4.500} x 100

TABLE-3.3

ANSWER KEY TABLE FOR BODY COMPOSITION

		Excellent	Good	Average	Below average	Poor
Normal	Male	60-80	81-90	91-110	111-150	150+
	Female	70-90	91-100	101-120	121-150	150+
Athletic	Male	40-60	61-80	81-100	101-130	130+
	Female	50-70	71-85	86-110	111-130	130+

3.11.6 FLEXIBILITY - SIT AND REACH TEST

Purpose

The purpose of the sit and reach test was to measure the flexibility of the low back and posterior thigh.

Equipment

The standard test apparatus consisted of a bench with a measuring scale of 23cm at the level of feet.

Procedure

The subjects sat on the floor with knees together and feet kept flat against the bench turned on its side. With a partner holding the knees straight, the subjects reached forward with the arms fully extended. They tried to reach the distance as much as they could without raising their knees. Measured the reached distance they touched with the fingertips on the scale fixed on the bench and recorded as score.

Scoring

The score was maximum distance reached and measured to the nearest centimeters **(George and Pamela, 1987).**

3.11.7 MUSCULAR STRENGTH - MODIFIED SITUPS

Purpose

The purpose of this test was to measure the abdominal muscular strength of the subjects.

Equipment

A mat, stop watch and clean floor.

Procedure

The subjects were asked to take a supine position on the mat, keeping their knees straight with feet apart, fingers interlocked and placed behind the neck. The feet were held by a partner and heels being in contact with floor at all times. On signal 'start' the subjects lifted the trunk up and touched their knee and then lowered their trunk to original position which is called 'sit-ups'.

Scoring

The total number of completed correct Sit-ups in one minute was recorded as score **(Mathews, 2011).**

3.11.8 CARDIO RESPIRATORY ENDURANCE - COOPER 9 MINUTE WALK/RUN TEST

Purpose:

To test aerobic endurance fitness (the ability of the body to use oxygen as an energy source).

Equipment required:

Running track, marking cones, recording sheets, stop watch, Whistle, Measuring Tape.

Procedure

Track was marked at every 10m in the 400 mts track. Markers was placed at set intervals around the track to aid in measuring the completed distance. The subjects were asked to run or walk in the track for nine minutes for the starting signal. Walking was allowed. At the end of nine minutes, the investigator blew the whistle to stop. The subjects were stood wherever they were for the stop whistle.

Scoring

Recorded the distance the subjects covered to the nearest 10 metres **(Cooper, 1968)**

3.11.9 STRESS - EVERLY AND GIORDANO'S STRESS SCALE

Purpose

The purpose of the test was to evaluate the stress level.

Equipment

Questionnaire - Everly and Giordano's Stress Scale (1979)

Reliability of Questionnaire

Many researchers have used the 'Everly and Giordano's stress scale (1979)' for the research purpose. Reliability established by split-half method following Spearman-Brown prophecy formula was found to be 0.84.

Description

The standard psychological tool devised by Everly and Giordano (1979) was used to evaluate the sports competition stress of the selected state level female basketball players. It consisted of 14 statements with Linker method scale of four alternatives such as: Almost always true, usually true, seldom true and never true. A copy of the questionnaire was given in Appendix F.

Scoring

The sum of all the weights assigned to all items was the total stress score of the individual. The minimum score 0 indicated low level of stress and the maximum score 42 indicated high level of stress **(Everly, Giordano and Dusek, 1990).**

Scoring Key

The alternative answers were assigned weight from 3 to 0 as follows.

TABLE-3.4

ANSWER KEY TABLE FOR STRESS

Responses	Value
Almost always true	3
Usually true	2
Seldom true	1
Never true	0

3.11.10 ANXIETY - MARTEN'S SPORTS COMPETITION ANXIETY TEST

Purpose

The purpose of the test was to evaluate competitive level of anxiety.

Equipment

Questionnaire - Sports Competition Anxiety Test (1977)

Reliability of Questionnaire

Many researchers have used the 'Sports Competition Anxiety Test (1977)' for research purpose. The reliability of the questionnaire was 0.82.

Description

Sports Competition Anxiety Questionnaire (SCAT) developed by Martens, Vealey and Burton (1977), was used to assess the sports competition anxiety level of the subjects. The questionnaire consisted of 15 statements representing each sub scale for each item with three responses, a) Hardly ever b) Sometimes c) Often. A copy of the questionnaire was attached in Appendix G.

Scoring

The score was recorded with the help of scoring key. Separate scoring system was followed for positive and negative statements, as given below. The score obtained for each statement was added and thus the total score was the score for sports competition anxiety **(Martens, Vealey and Burton, 1990).**

Scoring Key

Test items of S.No: 2,3,5,6,8,9,11,12,14 to 15 were scored according to the following methods where as the spurious items S.No: 1,4,7,10 to 13 had no score. Scoring for 6 to 11 was reversed according to the following key. 1point for 'Hardly ever', 2 points for 'sometimes' and 3points for 'often' was awarded.

3.11.11 ACHIEVEMENT MOTIVATION - KAMLESH'S ACHIEVEMENT MOTIVATION INVENTORY

Purpose

The purpose of the test was to evaluate the level of Sports Achievement Motivation.

Equipment

Questionnaire - Kamlesh's Sports Achievement Motivation Inventory (1982)

Reliability of Questionnaire

Many researchers have used the 'Kamlesh Achievement Motivation Inventory (1982)' for research purpose. Reliability established by split-half method following Spearman-Brown prophecy formula was found to be 0.83.

Description

Achievement motivation inventory devised by Kamlesh (1982) was used to quantify sports achievement motivation of the state level female basketball players. The inventory consisted of 20 partly completed statements. Each partly completed statement has two answers, which are equally good to make the incomplete statement meaningful and complete. Among the two answers the most appropriate one is the correct response. The respondents made a tick mark ($\sqrt{}$) on any one of the two answers that fit to them best. The item which was left and unanswered was not taken into consideration. A copy of the questionnaire was given in Appendix H.

Scoring

The score was recorded with the help of scoring key. Two marks were awarded for correct answers and no marks were for the wrong answers. The score obtained for each completed statement was added and the total score constitutes the sports achievement motivation score **(Kamlesh, 1983).**

Scoring Key

The range of score was 0 to 40. The answer for the question no. 1, 3, 4, 9, 10, 11,12,13,16,17,18 and 20 are 'a' and for the remaining questions 2, 5, 6, 7, 8, 14, 15 and 19, the answer is 'b' **(Ostrow and Andrew, 1996).**

3.11.12 SELF – CONCEPT - MUKTA RANI RASTOGI'S TEST

Purpose

The purpose of the test was to collect level of self concept.

Equipment

Questionnaire - Mukta Rani Rastogi's Self-Concept Scale (1980)

Reliability of Questionnaire

Many researchers have used the 'Mukta Rani Rastogi's Self-Concept Scale (1980)' to assess the self-concept for the research. Reliability established by split-half method following Spearman-Brown prophecy formula was found to be 0.87.

Description

The standard psychological tool devised by Mukta Rani Rastogi (1980) was used to assess the self concept of the state level female basketball players. The questionnaire consisted of 51 statements (23 positive and 28 negative questions) with five responses. A copy of the questionnaire was given in Appendix I.

Scoring

This test was scored with the help of scoring key. The score obtained for each statement was added and the total score was the score for self concept. Separate scoring system was followed for positive and negative statements as given below **(Horn, 2008).**

Scoring Key

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TABLE-3.5

ANSWER KEY TABLE FOR SELF-CONCEPT

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Response	Score for positive Statement	Score for negative Statement
Strongly Agree	5	1
Agree	4	2
Undecided	3	3
Disagree	2	4
Strongly Disagree	1	5

Test items of S. No: 1,2, 4, 6, 7, 8, 9, 18, 20, 24, 26, 27, 34, 36, 37, 40, 42, 43, 44, 46, 47, 48 and 49 were positive question numbers whereas 3, 5, 10, 11, 12, 13, 14, 15, 16, 17, 19, 21, 22, 23, 25, 28, 29, 30, 31, 32, 33, 35, 38, 39, 41, 45, 50 and 51 were negative question numbers.

3.12 PILOT STUDY

A pilot study was conducted to assess the initial capacity of the subjects in order to fix the training load, intensity and to make sure that the duration of exercise included in the program was within the limits of the subjects to ensure the satisfactory effect. For this, ten subjects were selected at random and divided into two groups of five each, in which group I underwent high intensity aerobic dance with yoga training and group II underwent low intensity aerobic dance with yoga training and group IV

underwent zumba dance with yoga training for the period of four weeks under the supervision of investigator. After the period of four weeks, the subjects were post tested. Based on the response of the subjects in the pilot study the training load for the experimental groups to the main study was fixed for a period of twelve weeks. After completion of the pilot study the present study was conducted on eighty subjects.

3.13 TRAINING PROGRAM

Eighty school girls were selected from Sri Sarada Vidyalaya Higher Secondary School, Holy Angels Higher Secondary School and St.Joseph Higher Secondary School, Salem. The selected subjects were divided into four equal groups consisting of 20 each. Experimental Group I (n=20) underwent high intensity aerobic dance with yoga training, Experimental Group II (n=20) underwent low intensity aerobic dance with yoga training, Experimental Group III (n=20) underwent zumba dance with yoga training for a period of twelve weeks. Experimental Group IV acted as control group as not engaged with any training. All the experimental groups were treated with their respective training program for the period of twelve weeks after the training period the post test was conducted.

Experimental group I: Underwent three days per week HI training.

Experimental group II: Underwent three days per week LI training with resistance training.

Experimental group III: Underwent three days per week ZD training with resistance training.

In each training session, the training was imparted for a period of ninety minutes which included warm down after the training programme for three days per week for a period of twelve weeks. The training session were held between 6.30am to 8.00am Monday, Wednesday and Friday. The length of training intervention for this study was based on the fact that twelve weeks has shown to be sufficient to prove significant changes of soccer players **Vaeyens, *et al.,* (2009).** The experimental group underwent their respective training programs under the supervision of the investigator.

3.14 ADMINISTRATION OF TRAINING

TABLE-3.6

Training Composition	Time
Warm-Up	15 Min
Asanas, Pranayama & Suryanamskar	10 Min
Dance Fitness Work-outs	50 Min
Cooling Down - Meditation	15 Min
Total Duration	**90 Min**

3.15 TRAINING INTENSITY

TABLE-3.7

Intensity	THR Target Heart Rate
For High	150 – 160bpm
For Low	120 – 130bpm
For Zumba	140 – 150bpm

3.16 IDENTIFICATION OF TARGET HEART RATE

Exercise intensity dictates the specific physiological and metabolic changes in the body during training. The training intensity was fixed through Kaarvonen Formula, that is maximal heart rate – age. The maximal heart rate = 220bpm-Age. The group I performed high intensity training programme. So the intensity constantly maintained 150 to 160 bpm.

3.17 FIXATION OF TRAINING HEART RATE ZONE

The training heart rate were fixed through Kaarvonen Method.

Kaarvonen Method – method to prescribe exercise intensity as a percentage of the heart rate reserve added to the resting heart rate, person heart rate reserve method.

Kaarvonen Formula – MHR(220bmp – Age)

Step 1 – Maximal HR – AGE

Step2 – Observe RHR - AGE

Step 2 – calculate HRR (MHR-RHR)

Step4 - CLACULATE TRAINING INTENSITY ZONE – TI = HRR X .30 + RHR

3.18 FREQUENCY

Frequency typically refers to the total number of weekly exercise session. Research shows that exercising three days a week on alternative days is sufficient to improve various components of Physical fitness.

3.19 DURATION

Duration and intensity of exercise are inversely related; the higher the intensity the shorter the duration of exercise. Exercise duration difference not only on the intensity of exercise but also on the subject health status, initial fitness level, functional ability and program goals. For improve health basis, the American College of Sports Medicine (ACSM) and American Heart Association (Nelson et.al, 2007) recommended that every individual accumulate 150min per week or mode of moderate intensity of aerobic exercise. This amount of physical activity can be achieved in either one continuous bout (30minutes of exercise on each five days or in multiple bouts of short duration throughout the day depending on the subject functional capacity and time constraint. As the subjects adopts to the exercise training the duration of the exercise may be slowly increased about every two or three weeks.

TABLE-3.8

DURATION OF TRAINING SCHEDULE

Training Details	Time
Warm-Up	10 Min
Asanas, Pranayama	10 Min
Varied Fitness Dance Training	30 Min
Warm Down - Meditation	10 Min
Total Duration	60 Min

3.20 TRAINING SCHEDULE FOR EXPERIMENTAL GROUP – I

High Intensity Aerobic Dance

At first, the experimental group I was received high intensity aerobic dance as per the schedule given below.

TABLE-3.9

Weeks	Aerobic dance exercises	Duration	Number of Sets	Recovery in between Repetitions	Target Heart Rate
I to IV	On Spot Marching Step Touch Power Walk V step Walk and Kick Grapevine T Step	**10 Minutes**	3	5 Min	**150 bpm**
V to VIII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	**15 Minutes**	3	5 Min	**155 bpm**
IX to XII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	**20 Minutes**	3	5 Min	**160 bpm**

After the completion of the said training programme the group was allowed to take five minute rest before the yogic programme. The subjects advised to perform twelve counts suryanamaskar practice. Following the suryanamskar the subjects were

performed specified asanas and pranayama for attaining more physiological characteristics. The detailed yogic practice programme was given below.

3.21 YOGA TRAINING FOR EXPERIMENTAL GROUP – I

TABLE-3.10

Training Week	Asana and Pranayama Name	Duration	Recovery in between yogic practice	No of Set	Recovery in between sets
I - IV	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 30 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	30 Counts	Recovery in between pranayama 1 min	2	3 min
V -VIII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 45 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	45 Counts	-	2	3 min
IX - XII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 60 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	60 Counts	Recovery in between pranayama 1 min	2	3 min

3.22 TRAINING SCHEDULE FOR EXPERIMENTAL GROUP – II

Low Intensity Aerobic Dance

At first, the experimental group I was received high intensity aerobic dance as per the schedule given below.

TABLE-3.11

Weeks	Aerobic dance exercises	Duration	Number of Sets	Recovery in between Repetitions	Target Heart Rate
I to IV	On Spot Marching Step Touch Power Walk V step Walk and Kick Grapevine T Step	10 Minutes	3	5 Min	120 bpm
V to VIII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	15 Minutes	3	5 Min	125 bpm
IX to XII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	20 Minutes	3	5 Min	130 bpm

After the completion of the said training programme the group were allowed to take five minute rest before the yogic programme. The subjects advised to perform twelve counts suryanamaskar practice. Following the suryanamskar the subjects were

performed specified asanas and pranayama for attaining more physiological characteristics. The detailed yogic practice programme was given below.

3.23 YOGA TRAINING FOR EXPERIMENTAL GROUP – II

TABLE-3.12

Training Week	Asana and Pranayama Name	Duration	Recovery in between yogic practice	No of Set	Recovery in between sets
I - IV	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 30 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	30 Counts	Recovery in between pranayama 1 min	2	3 min
V -VIII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 45 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	45 Counts	-	2	3 min
IX - XII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 60 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	60 Counts	Recovery in between pranayama 1 min	2	3 min

3.24 TRAINING SCHEDULE FOR EXPERIMENTAL GROUP – III

Zumba Dance

At first, the experimental group I was received high intensity aerobic dance as per the schedule given below.

TABLE-3.13

Weeks	Aerobic dance exercises	Duration	Number of Sets	Recovery in between Repetitions	Target Heart Rate
I to IV	On Spot Marching Step Touch Power Walk V step Walk and Kick Grapevine T Step	**10 Minutes**	3	5 Min	**140 bpm**
V to VIII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	**15 Minutes**	3	5 Min	**145 bpm**
IX to XII	On Spot Marching Step touch Power walk V step Walk and kick Grapevine T Step	**20 Minutes**	3	5 Min	**150 bpm**

After the completion of the said training programme the group were allowed to take five minute rest before the yogic programme. The subjects advised to perform twelve counts suryanamaskar practice. Following the suryanamskar the subjects were

performed specified asanas and pranayama for attaining more physiological characteristics. The detailed yogic practice programme was given below.

3.25 YOGA TRAINING FOR EXPERIMENTAL GROUP – III

TABLE-3.14

Training Week	Asana and Pranayama Name	Duration	Recovery in between yogic practice	No of Set	Recovery in between sets
I - IV	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 30 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	30 Counts	Recovery in between pranayama 1 min	2	3 min
V -VIII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 45 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	45 Counts	-	2	3 min
IX - XII	Tadasana Trikonasana Artha chakrasana Uttanasana Utkat asana Chakrasana Dhanurasana Mayurasana Sarvangasana Suryanamaskar	Each 60 Seconds (Final Posture) x 5 Times	Recovery in between asanas 1 min	2	3 Min
	Pranayama – Bhastirika	60 Counts	Recovery in between pranayama 1 min	2	3 min

3.26 STATISTICAL TECHNIQUES

The pre-test and post-test data of the experimental and control groups on the respective variables were analyzed with various statistical techniques. The following statistical techniques were used for analyzing the data of variables.

Descriptive statistics such as mean and standard deviation were found in order to get the basic idea of the data distribution. 't' test was done for finding whether there is any statistically significant pre-test to post-test mean differences in their respective variables of each groups.

It is to be noticed that the individuals in the experimental and control groups may vary widely in the initial pre-test scores. By using the analysis of variance (ANOVA) for testing the significance of the difference between the post-test means of the experimental and control groups, the influence of the initial pre-test scores to the final post-test scores were ignored. These pre-test scores are called 'covariates'. Therefore we have to eliminate or to keep under control the effect due to these covariates (pre-test scores) from the final scores (post-test scores). Hence, the data should be analyzed by the technique of analysis of covariance (ANCOVA) rather than analysis of variance (ANOVA). ANCOVA tests the significance of 'adjusted post test mean' differences between the experimental and control groups for each variable. Adjusted post-test means are the post test means after eliminating the effect due to the pre-test (initial) scores. The adjusted technique serves to remove from the final scores that portion which is due to the relation between covariate (pre-test scores) and the final scores.

Whenever the 'F' ratio for adjusted post test was found to be significant the scheffe's post hoc test was applied to find out difference between the paired adjusted means. 0.05 level of confidence was fixed for physical, physiological and psychological variables to test the level of significance.