

**EFFECT OF CYCLIC MEDITATION AND YOGA NIDRA ON
SELECTED PHYSIOLOGICAL AND PSYCHOLOGICAL
VARIABLES IN COLLEGE LEVEL ATHLETES**

By

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A THESIS

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CERTIFICATE

This is to certify that the thesis entitled “Effect of Cyclic Meditation and Yoga Nidra on Selected Physiological and Psychological Variables in College Level Athletes” submitted to the University of Calicut, is a record of original research work done by Mr. Biju Lona K. under my guidance and supervision for the degree of Doctor of Philosophy in Physical Education. It is further certified that the completed research study by the scholar is an original of this kind and has not been carried out by any scholar in any other University.

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D E C L A R A T I O N

I hereby declare that the thesis entitled “Effect of Cyclic Meditation and Yoga Nidra on Selected Physiological and Psychological Variables in College Level Athletes” submitted to the University of Calicut for the award of the Degree of Doctor of Philosophy is a record of original research work done by me under the guidance and supervision of Dr.K.P.Manoj, Assistant Director and Head, Department of Physical Education, University of Calicut and that it has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other similar title of any candidate of any University.

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Chapter I

INTRODUCTION

In this era of advanced science and technology, an athlete is shaped by years of long planning and preparation with sophisticated machines. Modern physics has changed the structure of playing surfaces, sports wears and equipment, while Molecular biology is extracting the structure of an athlete by means of genes. At the same time, Biotechnology examines the application of cloning and genetic engineering in sports performance, besides, the advancement in Neurophysiology reveal the mystery over the functioning of mind and Psychology is in the path to unearth the newer facets of mindset of an athlete. All these development have made an athlete a competitive machine with a complicated mind.

The saying of ‘the great Marathon is won with mind not with legs’ emphasizes the importance of mind in athletic performances. The international problem today is not hunger, poverty, drugs or war but total tension. There is no exception for athletes. An athlete can reach better heights, if he or she is able to overcome his or her tensions, control his or her emotions, anger and passions. The mind set of an athlete is very closely associated with sports performance. If an athlete knows the lessons of total relaxation, he or she can very well balance his or her emotions and tensions thereby improving upon the performance.

A question arises why, two physically and physiologically identical athletes perform in a different manner? Why an athlete performs very badly in the actual competition when compared to the performance in the training sessions? And the

questions end with the mind set of the athletes. In the pursuit of excellence in sports, the great hurdle that an athlete should overcome is his or her own functions of the mind. Of course it is not easy to train the mind as one train the body. This investigation focuses on how the ancient wisdom of Yoga and Upanishads are helpful to the athletes for better performances in sports competitions.

Yoga is one of the six streams of Indian philosophy called '*Sad Darsanas*'. It is the ancient system of training the body, mind and soul. Its importance for the spiritual attainment has been recognized throughout the ages by all systems of Indian Philosophy. However, its application in various fields is rare and rarer in the arena of sports performance. The yogic texts all unequivocally state that peace can only be found within, never without. Therefore an athlete should learn how to relax and harmonize his or her body and mind to be successful in the field of competition.

While going through the literature on Yoga and on consulting experts well versed in the science of Yoga, it is very clear that the term Yoga has been studied, defined and viewed very broadly and elaborately. The term Yoga has its verbal root in Sanskrit '*Yuj*' which means joining.

'Yujyate anena iti Yogah'. Meaning of this *sloga* is Yoga is that which joins.

The renowned sage Patanjali, in his text Yoga Sutras has defined yoga as '*Yoga Chitta Vritti Nirodhah*'. (Yoga Sutras 1:2). This *sloga* means that Yoga is a conscious process of gaining mastery over the mind. According to Patanjali, The mind (chitta) is made up of three components, *Manas*, *Buddhi*, and *Ahamkara*. *Manas* is the

recording faculty which receives impressions gathered by the senses from the outside world. *Buddhi* is the discriminative faculty, which classifies these impressions and reacts to them. *Ahamkara* is the ego sense, which claims these impressions for its own and stores them up as individual knowledge.

In Yoga Vasistha, one of the best texts on Yoga, the essence of Yoga is portrayed as '*Manah Prasamanopayah Yoga Ityabhidhiyate*' (Yogavasistha 3.9.32). This *sloga* means that Yoga is a skillful methodological trick to calm down the mind. It is a method of allowing the mind to calm down and not to use brutal force to stop it. Yoga is the dexterity in action and this dexterity is in maintaining relaxation and awareness in action. Relaxed action is the process and efficiency in action is the outcome. Thus Yoga is the skillful science of gaining mastery over the mind. If an athlete knows the dexterity of awareness and relaxation in his or her training process, the performance can be boosted to the expectation. According to Yoga, stress is imbalance and is a misery which decreases the performance of athletes. At the mental level as well as at the physical level this imbalance due to excessive speed causes ailments and diseases which lead to poor performance.

Muscular relaxation is related to the body, the nervous system and the endocrinal imbalances. After strenuous hours of muscular exertion, the athletes are badly in need of relaxation and the muscular tensions can easily be removed by deep physical relaxation. A few hours of rest or sleep or practicing Savasana will be enough to get away from muscular tension.

Emotional tensions stem from various dualities such as love and hate, profit and loss, success and failure, happiness and unhappiness and are more difficult to erase. This is because the athletes are unable to express their emotions freely and openly. Often the trainers and athletes refuse to recognize them and are suppressed, thus resulting tensions become more and more deeply rooted. It is not possible to relax these tensions through ordinary sleep or relaxation but can be controlled through methods such as Yoga Nidra and Cyclic Meditation.

Mental tensions are the result of excessive mental activity as mind is the whirlpool of fantasies, confusions and oscillations. Throughout our life the experience registered by our consciousness are accumulated in the mental body. From time to time these explode, affecting our body, mind, behavior and reactions. The athlete is not an exception, hence, when an athlete is sad, angry or irritated, they often attribute that condition of the mind to some superficial cause. But the underlying cause behind every man's abnormal behavior lies in the accumulated tension on the mental plane.

Yoga Nidra is a systematic method of inducing complete physical, mental and emotional relaxation developed by the Bihar School of Yoga. The term Yoga Nidra is derived from two Sanskrit words, '*Yoga*' means union or one pointed awareness, and '*nidra*' means sleep. During the practice of Yoga Nidra one appears to be asleep, but the consciousness is functioning at the deeper level of awareness, so that Yoga Nidra is often referred to as psychic sleep or deep relaxation with inner awareness. In this threshold state between sleep and wakefulness, contact with the subconscious and unconscious dimensions occurs spontaneously.

In the yogic system, Yoga Nidra is considered as a form of Raja Yoga. The classic exposition of Raja Yoga is found in the Yoga sutras, a masterful collection of 196 aphorisms written by sage Patanjali who is said to have lived in 300 B.C. Yoga Nidra belongs to the higher stages of Raja Yoga, as it is essentially a method of *Prathyahara* (Control of senses). Awareness is progressively withdrawn from the external world, the body, the process of breathing, the conscious mind, and finally from the unconscious mind.

The science of Yoga Nidra is based on the receptivity of consciousness. When consciousness is operating with the intellect and with all the senses, by making an individual think that he or she is awake and aware, but the mind is actually less receptive and more critical. When the consciousness is operating through only one channel i.e. hearing, it becomes far more sensitive. The receptivity of an athlete during Yoga Nidra is higher or in other words when the relaxation is complete, the receptivity is greater. On the other hand, the consciousness is connected to all the senses, the receptivity is less. This is the secret of Yoga Nidra. During concentration one knows that he or she is concentrating. But when an athlete is in the state of Yoga Nidra, there comes a moment when he or she does not know that he or she is in Yoga Nidra. In Yoga Nidra the mind is trained by taking it through a series of practices, which bring about the desired state of awareness.

Yoga Nidra is a proficient method for attaining the state of deep relaxation. The degree of relaxation can be analysed by the biofeedback equipment. The main piece of biofeedback equipment is Electrical Skin Resistance (ESR) Meter, which is

more accurate than the more commonly used GSR. It is known that a particular yogic relaxation technique may not be suitable for all kinds of individual so as for getting the optimum level of relaxation. Desirable modification in yogic relaxation techniques can be done for the best results in the individuals with varied psychic state such as over arousal, fixed, fluctuating, under arousal and balanced. Hence the true relaxation should be a tailor made one and it should be designed according to the interest, need and mental state of an individual (Sathyananda, 2005).

Meditation is considered as the fourth major state of mind, equal to dreaming, sleeping, and wakefulness. Consciousness during Yoga Nidra is in a very deep and stable state and the awareness can be maintained in the deep Yoga Nidra state. The consciousness and awareness in meditation state was analysed and recorded by taking the picture with the help of PET (Position Emission Tomography) Scanner (Sathyananda, 2005).

Sport is an area of cut throat competition. The stress developed in an athlete due to ever increasing degree of competition should be controlled for better performances. Athletes can be very much benefited by Yoga and *Vedas*, as they are the treasures of wisdom. They reveal the technique of mind control, relaxation and stimulation. *Upanishads* forms the essence of *Vedas*, called *Vedanta*. It is also the latter part of *Vedas*, called "*Jnana Kanda*" and reveal the groups of mind control, relaxation and stimulation. The smallest and most profound among *Upanishads* is *Mandukyopanishad*. In tradition, the commentary (*Karika*) is regarded as a part of the

Upanishad itself. The theory and the essence of Cyclic Meditation is based on *Mandukya* and *Taittiriya Upanishads*.

In order to understand the stress of an athlete, a holistic concept of man is kept in view rather than mere bodily existence. *Taittiriya Upanishad* has presented the holistic concept of man systematically. It reveals the truth of five sheaths of human existence. They are *Annamayakosa* (Physical sheath), *Pranamayakosa* (Vital sheath), *Manomayakosa* (Astral sheath), *Vijnanamayakosa* (Wisdom sheath) and *Anandamayakosa* (Bliss sheath). According to *Taittiriya Upanishad* the cause of stress begins at *Manomayakosa* as a result of strong likes and dislikes of an athlete. This creates imbalances in the *Pranamayakosa* and it percolates to the *Annamayakosa* causing stress symptoms and hazards.

As a formula to control stress and as a solution to both hyper and hypo active athlete, the most profound and the shortest of all *Upanishads*, *Mandukya* describes the two fold process of '*sadhana*' (Practice). The essence of Cyclic Meditation is beautifully described in the *Mandukyopanishad* as:

*'laye sambodhayet chittam, Vikshiptham samayet punah
Sakasayam vijaneeyat Samapraptham na jalayet'*

(Man Karika-III-44)

Meaning of this *sloga* is stimulate and awaken the sleeping mind, calm down the distractions, recognise the innate stagnations and stay in steadiness without disturbing it. When the mind gets to a state of lethargy, stimulate and awaken it and

when it starts speeding up and distractions set in, calm it down again. Thus the series of successive stimulations and relaxations can solve the complex problem of mind. Each stimulation helps to open up the stagnations or constrictions and release of stimulations brings relaxation. When the relaxation continues for a while, the human system reaches a saturation level often leading to stagnation or drowsiness. It is then that we stimulate again. Successive stimulations and relaxations one after the other help to release stresses at deeper and deeper levels.

The core of the solution is meant to provide stimulation and relaxation alternatively and effectively to the athlete. Stimulation can be provided by various Yoga groups like *asanas* and *pranayams*. A basic frame of *Yogasana* acts as a skeleton on which to build the flesh and nerves to give a shape. Breathing, *pranayama*, awareness, meditation and feeling etc. are harmoniously interwoven to overcome stress.

It is reported that Cyclic Meditation is useful for the executives and others with excessive tension to reduce blood pressure, steep decrease in the consumption of tranquillisers, clarity in thinking and relaxed feeling in action (Nagendra 2003).

The thought of performance, injury and outcome of the competition, emotional imbalances set in the mind of the athletes percolate in the physical body causing physiological changes in the body and these disturbances can be observed in the vital signs. Hence, the physiological variables selected for the study are the various vital signs such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature of the athlete.

One of the most common observations made by the medical practitioners in relation to a patient's condition or progress is that of assessing the temperature, pulse, blood pressure and respiration, as these findings are governed by the vital organs and often disclose even the slightest deviation from normal body functioning. It is obvious that when the athlete is subjected to tension, his or her body temperature, pulse rate, blood pressure and respiratory rate would be higher than the normal. Practice of Yoga is helpful for reducing tension, pulse rate, resting metabolism and stress and thereby players exhibit a relaxed state, which steadily improve their performance on the field. (Mukherjee, 1977). Savasana and meditative techniques are found to be useful for improving relaxation and for reducing the blood pressure and pulse rate (Udupa, 1977).

The psychological variable selected for the study were Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression as they were found to be very closely related to athletic performance. Anxiety is one of the important psychological factors influencing sports performance and is a complex emotional state that can be characterized as a general fear of foreboding usually accompanied by tension and is related to fear of failure, either real or anticipated. The basic anxieties are state anxiety and trait anxiety, which are further classified as Cognitive Anxiety and Somatic Anxiety.

One of the major research avenues for sport psychology has been the influence of anxiety on performance. Anxiety and other unpleasant feelings are integral to participation in competitive sport. Consistent with general anxiety research, the major

situational factor found to be related to the perception of threat during and immediately following sport competitions are success and failure. Emotional state is aroused in the situation of impending danger and is manifested in fear of unfavorable events. Anxiety represents generalised, defused or pointless fright and it may manifest itself as a feeling of helplessness, uncertainty of oneself and lack of sufficient strength.

Losing confidence is no longer trusting in the ability to perform. It may be due to the result of past failures to perform or unreasonable, because one "just has a feeling" about something or is having doubt. "Choking" refers to losing confidence, especially self confidence, just at the moment when it is needed most to win a sport and doing poorly as a result.

An unconfident person on the other hand gets paralyzed due to anxiety. The person tends to have lot of self-doubts, becomes very critical about himself or herself and have low opinion of self. This causes a vicious cycle where the anxiety cripples the person into inaction, and he or she continues to berate himself or herself, thus, creating more anxiety. When the anxiety is at an optimum level one is at the best. One should know that negative outcomes are possible, but rather than exaggerating or minimizing it, an individual gives it the due attention necessary. Hence, confidence can be defined as the state of balanced perceptions and preparation.

Anger an acute emotional reaction elicited by a number of stimulating situations, including threat, overt aggression, restraint, verbal attacks, disappointment or frustration is characterized by strong responses in the autonomic nervous system,

particularly by emergency reactions of the sympathetic division and by implicit or overt attack responses that may be either somatic or verbal (Atkinson et al., 1996).

Relationship between Aggression and sports performance has always been a matter of thought in the field of sport psychology. Aggression is a behavioral aspect and differs from attitude, emotion or motive and is considered as an intentional behaviour. Accidental harm is not an aggression but the acts that are intended to injure someone are treated as aggression. Non physical behaviors can constitute aggression along the same grounds as physical behaviour. Verbal utterance or gestures can be behaviors with intent and ability to cause psychological harm. Aggression can be either Instrumental or Hostile. Instrumental aggression is the part of aggression where the intention is not to harm another individual but to win a competition, whereas the hostile aggression is the part of aggression where the primary goal is not to win a competition but to inflict injury on another. Instrumental aggression is considered as supportive for improving sports performances and hostile aggression is considered as one of the causative factor for debilitating sports performances.

A victory in the international sports competition demands a lot from the athletes. It is a competition between equals, so that each and every aspect of an athlete is very crucial and dependable for ensuring elite performance, as a matter of fact there is not much difference between winners and losers. One by thousand of a second, a micrometer of difference, a quiet negligible mistake or a flash of thought may be enough to draw a landmark in the international sports scenario. Modern groups of

sports training emphasize physiological, skill based and tactical aspect of an athlete, and rarely give importance to the psychological aspects especially the need of total relaxation and meditation.

Tension and stress never go hand in hand with elite performances in sports. Tension will be varying according to the nature of the athlete and the standard, nature and type of competition one participates. The nature of the athletes can be modified through psychological intervention and training in order to control tension. But training the mind and bringing the desired mindset in the athlete is not easy as that of training the body. The main reason for this is the less receptivity of consciousness of the athletes, hence the tension generated in the athlete stands as a barrier and debilitating factor for elite sports performances.

The thirst for medals in elite international sports competitions can be quenched by introducing meditation sessions of various techniques in the training programmes of the athletes so as to tame the minds, thereby enabling India to win medals and hope for elite performances in major international sports competitions like Olympics and World Championships.

Statement of the problem

The purpose of the study was to determine the effect of Cyclic Meditation, Yoga Nidra and a Combination of Cyclic Meditation and Yoga Nidra on selected physiological and psychological variables in college level athletes.

Delimitations

- 1) The subjects selected for the study were confined to 40 male and 40 female college level athletes of age between 17 to 25 years.
- 2) The study was confined to the following three meditation programmes.
 - a) Yoga Nidra
 - b) Cyclic Meditation
 - c) Combined Meditation (Combination of Yoga Nidra and Cyclic Meditation).
- 3) The number of subjects selected for each group was limited to 20 consisting of 10 males and 10 females.
- 4) The duration of experimental period was restricted to twelve weeks and the number of sessions per week were confined to three.
- 5) The study was restricted to the assessment of the following variables.

Physiological Variables

- a) Pulse Rate
- b) Respiratory Rate
- c) Systolic Blood Pressure
- d) Diastolic Blood Pressure
- e) Body Temperature

Psychological Variables

- a) Cognitive Anxiety
- b) Somatic Anxiety
- c) Self Confidence
- d) Instrumental Aggression
- e) Hostile Aggression

Limitations

As an experiment study, the researcher had taken all necessary steps to control the intervening variables, which might have had an effect on results of the study. They are listed below.

- 1) Variations in living conditions, life styles and dietary habits of the athletes which might have affected the study during the experimental period are treated as limitations.
- 2) The environmental changes and climatic conditions during the treatment period were not considered for the study.

Hypothesis

On the basis of review of the related literature, expert opinion and the scholar's own understanding of the problem, the following hypotheses were formulated for the present study.

- 1) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the physiological variable Pulse Rate.
- 2) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the physiological variable Respiratory Rate.
- 3) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the physiological variable Systolic Blood Pressure
- 4) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the physiological variable Diastolic Blood Pressure
- 5) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the physiological variable Body Temperature.
- 6) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic

Meditation and Combined Meditation on the psychological variable Cognitive Anxiety.

- 7) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the psychological variable Somatic Anxiety.
- 8) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the psychological variable Self Confidence.
- 9) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the psychological variable Instrumental Aggression.
- 10) There will not be any significant difference between pre and post test means of the three meditation groups namely Yoga Nidra, Cyclic Meditation and Combined Meditation on the psychological variable Hostile Aggression.
- 11) There will not be any significant difference among the three experimental meditation groups and control group on the physiological variable Pulse Rate.

- 12) There will not be any significant difference among the three experimental meditation groups and control group on the physiological variable Respiratory Rate.
- 13) There will not be any significant difference among the three experimental meditation groups and control group on the physiological variable Systolic Blood Pressure.
- 14) There will not be any significant difference among the three experimental meditation groups and control group on the physiological variable Diastolic Blood Pressure.
- 15) There will not be any significant difference among the three experimental meditation groups and control group on the physiological variable Body Temperature.
- 16) There will not be any significant difference among the three experimental meditation groups and control group on the psychological variable Cognitive Anxiety.
- 17) There will not be any significant difference among the three experimental meditation groups and control group on the psychological variable Somatic Anxiety.
- 18) There will not be any significant difference among the three experimental meditation groups and control group on the psychological variable Self Confidence.

- 19) There will not be any significant difference among the three experimental meditation groups and control group on the psychological variable Instrumental Aggression.
- 20) There will not be any significant difference among the three experimental meditation groups and control group on the psychological variable Hostile Aggression.

Definitions and Explanations of Terms

Athlete

Athlete is a person who actively involves and takes part in sports activities.

Yoga Nidra

Yoga Nidra is the science of relaxation which enables to dive deep into the realms of the subconscious mind, thereby releasing and relaxing mental tensions and establishing harmony in all facets of being. (Swami Sathyananda Saraswati 2005)

Cyclic Meditation

Cyclic Meditation is a meditative technique based of *Taittiriya* and *Mandukya Upanishads* consisting of a combination of successive stimulation and relaxation programmes in order to solve the complex problems of the mind (Nagendra 2003).

Combined Meditation

It is a combination of Yoga Nidra and Cyclic Meditation technique chosen for the study to find out the combined effect of both on athletes.

Pulse Rate

Pulse Rate is defined as the number frequencies of the alternate expansion and contraction of the arteries by the wave of the blood forced into them as the heart's left ventricle contracts in a minute.

Respiratory Rate

Respiration is defined as the act of breathing. It is the process of taking oxygen and giving out of carbon dioxide. Respiratory Rate is the number of respiration per minute.

Blood Pressure

Blood pressure is defined as the force exerted by the blood against the walls of the blood vessels as it flows through them. Reading of Blood pressure is recorded as systolic and diastolic.

Systolic Blood Pressure

Systolic Blood Pressure is the highest degree of pressure exerted by the blood against the arterial walls as the left ventricle contracts and forces the blood from it into the aorta.

Diastolic Blood Pressure

Diastolic Blood Pressure is the lowest degree of pressure when the heart is in its resting period just before contraction of the left ventricle.

Body Temperature

Body temperature is defined as the degree of the heat maintained by the body. It is the balance between the heat generated and lost.

Anxiety

Anxiety is the state of emotional and physical disturbances included in a person by real or imagined threat. In physiology the term refers to disturbances caused by threats that are only apparent to the individual and cause him or her to behave in a way that is not relevant to the present situation. Sports Competition Anxiety has two major dimensions of anxiety such as Cognitive and Somatic Anxiety.

Cognitive Anxiety

Cognitive Anxiety is the mental component of Trait Anxiety caused by such things as fear of negative social evaluation, fear of failure and loss of self esteem.

Somatic Anxiety

Somatic Anxiety is the physical component of Trait Anxiety that reflects the perception of such physiological responses as increased heart rate, respiration and muscular tension.

Self Confidence

Self Confidence is the state of balanced perceptions and preparation or rather is the state of having confidence in oneself.

Aggression

Aggression is defined as an overt act verbal or physical that has the capacity to cause psychological or physical injury to another. The act must be purposeful, non accidental and chosen with intent of causing injury. It has been further described as Hostile Aggression and Instrumental Aggression.

Instrumental Aggression

Instrumental Aggression is the part of aggression where the intention of aggression is not to harm another individual but the goal is to realize an external goal i.e. to win a competition.

Hostile Aggression

Hostile Aggression is the part of aggression where the primary goal is to inflict injury on another human being.

Significance of the study

The world of sports has always been the world of competition too and the beauty of sports lies in its competitions. But as the days go by, the intensity of competition is getting more and tougher and the sports arena has become a battlefield for the athletes. Hence, no competition leaves the athletes without creating mental turmoil in their minds, as a matter of fact steadiness and the presence of mind are two essential prerequisites for excellence in performance in sports and games. The results of this study will enable the utilization of the ancient wisdom of *Vedas* and Yoga by the athletes to master the mind, so as to improve performances in sports and games. In this regard, the ultimate goal of research in physical education and sports is to bring out innovations in training programmes for the improvement of performance in sports and games and accordingly the practical contribution of research findings of this study will have the following significant contributions.

- 1) The results of this study will reveal the effectiveness of Yoga Nidra on the Physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature of athletes, so as for utilization of the technique Yoga Nidra for better performance at elite National and International Competitions.
- 2) The results of this study will reveal the effectiveness of Cyclic Meditation on the Physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature of athletes, so as for utilization of the

techniques Cyclic Meditation Nidra for better performance at elite National and International Competitions.

- 3) The results of this study will reveal the effectiveness of Combined Meditation technique on the Physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature of athletes, so as for utilization of the techniques Combined Meditation for better performance at elite National and International Competitions.
- 4) The results of this study will be helpful to find out the effectiveness of Yoga Nidra on the selected Psychological variables such as the Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression of athletes so as for utilization of the techniques Yoga Nidra for better performance at elite National and International Competitions.
- 5) The results of this study will be helpful to find out the effectiveness of Cyclic Meditation on the selected Psychological variables such as the Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression of athletes so as for utilization of the techniques Cyclic Meditation for better performance at elite National and International Competitions.
- 6) The results of this study will be helpful to find out the effectiveness of Combined Meditation technique on the selected Psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self

Confidence, Instrumental Aggression and Hostile Aggression of athletes so as for utilization of the techniques Combined Meditation for better performance at elite National and International Competitions.

- 7) The results of the study will reveal which of the meditation techniques is more beneficial on physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature on athletes.
- 8) The results of the study will reveal which of the meditation techniques is more beneficial on psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression on athletes.

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Chapter II

REVIEW OF RELATED LITERATURE

Relevant information regarding the area of the present exploration has been obtained with the help of experts in psychology and sport, related books, journals, sport magazines and newspapers. A brief account of the review of literature related to the present study, which the research scholar gathered from various sources are categorized below.

Sameer (2007) conducted a study on sports competition anxiety of University level women basketball players. The investigation was to find out the difference on Sports Competition Anxiety of South and West zone University level women basketball players. The subjects were randomly selected 60 women basketball players, 30 from south zone and 30 from west zone Universities who have participated in the South West Zone Inter University Women Basketball tournament during the year 2006. Anxiety levels were obtained by administering Sports Competition Anxiety (SCAT) questionnaire of Renier Martens, a day before they were to play their matches. The findings revealed that the significant difference existed on Sports Competition Anxiety between south and west zone players.

Kaur et.al (2007) investigated the relationship between achievement motivation and pre competition anxiety of University level hockey players. The secondary purpose was to compare high and low pre competition anxiety groups on achievement motivation. 50 male hockey players who have participated in the All India Inter University Men Hockey Championship in Banaras Hindu University, Varanasi in 2007 were randomly selected for this study. The study revealed that

significant relationship existed between achievement motivation and pre competition anxiety of University level male hockey players.

Princy and Raj (2007) investigated on the effect of yogasana on cholesterol in college women. Twenty women students aged between 18 and 22 years were randomly selected as subjects and were later randomly divided into two groups of equal sizes, an experimental group and a control group. Yogasana training was given to the experimental group and the control group was not allowed to participate in any type of training programme. The subjects were tested on cholesterol at the beginning (pre-test) and at the end of the training period of six weeks (post-test). After analysis using analysis of covariance the result showed that there was significant difference in means on cholesterol as a result of yogic asanas training.

Shenbagavalli and Rajkumar (2007) conducted a study on the effect of pranayama on selected physiological variables among men volleyball players. The subjects were twenty-four male physical education students studying at Dr.Sivanthi Aditanar College of Physical Education, Tiruchendur and were randomly divided into two groups viz. the experimental and the control group. Data were collected from each subject before and after the training programme and was statistically analysed using analysis of covariance (ANCOVA). The results revealed that there existed significant difference in means on selected physiological variables of resting pulse rate and breath holding time of experimental group when compared to the control group.

Kaur and Rathee (2006) conducted a study on personality differentials and motivation among participants of yoga, athletics and aquatics. The subjects were 90 randomly selected students who have participated at the inter college level competitions in yoga, Athletics and Aquatics from both sexes and in equal proportions. Personality inventory developed by Bhargawa (1998) and Sports Achievement Motivation Questionnaire developed by Kamlesh (1990) were used. The data were analysed using one way anova and t-test and the level of significance was set at 0.05 level. The result of the study indicated that men participants of aquatics group were found to be significantly better than the yoga group. Among the female sports person, the athletes were found to be significantly better than yoga participants.

Bhatia and Lata (2005) investigated on the effect of selected yoga exercises on balance and perception of college level players. Forty female players were selected as subjects from University College of Kurukshetra University. The sample was further randomly divided into two groups, Group A the experimental group and B the control group. The test of balance (static & dynamic) and of perception was taken as criterion measures. Group A were given a programme of selected yoga asanas for a period of six weeks, while group B was not given any training. The analysis of data revealed that yogic exercises were effective to develop perception and balance.

Lohan and Rajesh (2002) conducted a study to find out the effect of asanas and pranayamas on physical and physiological components of boys. 120 male students of age between 12 to 16 years were selected randomly from Kurukshetra and divided equally into four groups consisting of 30 subjects each, i.e., Asana group, Pranayama group, Combined group and Control group. Physical fitness variable selected for the study were strength, speed, agility, power and endurance. The

physiological variables selected for the study were blood pressure, vital capacity and pulse rate. Students were given 10 weeks of training programme. AAPHER Youth Fitness Test Battery was used to measure physical fitness components and standardized tests were used to measure the physiological variables. The result showed that significant difference in means was found between the pre and post test scores of asana group in the physical fitness variable sit ups. On the other hand, there was no significant difference in means on the other physical fitness variables of the asanas group. Significant statistical difference in means was found between pre and post test score of combined group on all selected physical fitness variables except speed and endurance. No significant differences were found between the pre and post test means of control group. Besides, significant differences were found on physiological variables between pre and post test scores of Asana group, Pranayama group and Combined group, On the other hand no significant differences were found between the pre and post test means of the control group.

Kant and Mishra (2001) conducted an empirical study on the contribution of yoga to sports. He categorized the contribution under four headings, namely yoga for the prevention of sports injuries, yoga for the cure of sports injuries, yoga for the promotion of sports and yoga for the maintenance of physical fitness during the competition period as well as in off-season.

Telles et.al (2000) studied on oxygen consumption and respiration following two yoga relaxation techniques so as to evaluate a statement in the ancient yoga texts which suggests that a combination of both 'calming' and 'stimulating' measures will specifically help in reaching a state of mental equilibrium. Two yoga practices, one combining 'calming' and 'stimulating' measures (Cyclic Meditation) and the other, a

'calming' technique (shavasana) were compared. The oxygen consumption, breath rate and breath volume of 40 volunteers (group mean age and SD= 27.0 and 5.7 years) were assessed before and after training sessions of Cyclic Meditation (CM) and before and after training sessions of Savasana. The two sessions (CM, SH) were one day apart. Cyclic Meditation includes the practice of yoga postures interspersed with periods of supine relaxation. During SH the subjects lie in a supine position throughout practice. There was a significant decrease in the amount of oxygen consumed, in breath rate and an increase in breath volume after both types of training programmes (two factor ANOVA, paired t test). However the magnitude of change on all three measures was greater after cyclic meditation.(i) Oxygen consumption decreased 32.1% after CM compared with 10.1% after SH:(ii) Breath rate decreased 18.8% after CM and 15.9% after SH: The study concluded with the assumption that a combination of yoga postures interspersed with relaxation reduces arousal more than relaxation alone does.

O'Connor et.al (2000) present a selective overview of recent research concerning physical activity, anxiety and anxiety disorders. Major conclusions include that exercise training was associated with a reduction of anxiety symptoms in patients with panic disorder among young women following single episodes of aerobic exercise (AE) performed in a naturalistic exercise setting and quiet rest (QR). Given the salience of self presentational qualities in a naturalistic exercise setting, a secondary purpose was to examine whether psychological responses to acute exercise varied as a function of Social Physique Anxiety (SPA). The dependent measures of state anxiety; positive engagement, revitalization, tranquility, and physical exhaustion were assessed immediately prior to and then at 5 and 31 minutes following each

condition. It was found that (a) AE and QR were associated with and decreases in state anxiety and on the other hand increases in tranquility; (b) AE was associated with and increases in positive engagement and revitalization; and (c) these changes did not vary as a function of SPA level.

Sing (2000) conducted a study on the effect of yogasana on selected physical and psychological variables of college level students in relation to sports performance. The selected physical variables were strength, agility, speed, endurance and flexibility and the psychological variables were state anxiety, security-insecurity, emotionality and hand steadiness in relation to sports performance. The results reflected that regular practices of yogasana improved the level of physical fitness components such as strength, flexibility and agility. Besides, it was also found to reduce State Anxiety to a great extent as a result of yogasana practice.

Bhatta and Kumar (2000) conducted a study on the influence of Yoga Nidra on brain rhythms of man. The purpose of the study was to find out the effect of yogic relaxation on mental tension, heartbeat, respiratory rate, blood pressure and behaviour of patients with hypertension. The experiments were carried out on patients of hypertension with disturbed sleep having different age group ranging from 35 years to 70 years. It was found that the blood pressure after the Yoga Nidra training came down to normal level without medication. The disturbed sleep was restored successfully without tranquilizers through the practice of yogic relaxation technique Yoga Nidra. The hypertensive patients showed decreasing heart beat after practicing Yoga Nidra. The heart beat after the fourth week of experiment was brought to the normal range of 70-75 per minute without medication. The hypertensive patients who were suffering from disturbed sleep got rid of their disturbances after the final

treatment and they got sound sleep of 6-7 hour duration. Besides, after the treatment of Yoga Nidra the respiratory rate came down to 12-14 per minute from the pre treatment rate of 15-20 per minute.

Vempati and Telles (1999) conducted a study on yoga based Isometric Relaxation Technique versus Supine Rest on physiological variables of oxygen consumption, breath rate, breath volume and autonomic measures at Vivekananda Kendra Yoga Research Foundation, Bangalore. Forty male volunteers with age ranging from 16 to 46 years were studied in two sessions of yoga based isometric relaxation technique and Supine Rest (SR). Assessments of autonomic parameters were done on 15 subjects before and after Isometric Relaxation Technique. At the same time on the other 25 subjects oxygen consumption, breath rate and breath volume were measured before and after the supine rest. A significant decrease in breath rate after isometric relaxation technique and in linger Plethysmogram was recorded after supine rest. The results suggested that Isometric Relaxation Technique is useful for reducing some physiological signs of anxiety.

Manjunath and Telles (1999) conducted a study on improvement in visual perceptual sensitivity in children following yoga training. A sample of 14 children with ages ranging from 12 to 17 years (8 males and 6 females) were given 10 days of yoga training. Another 14 whose age and sex matched acted as control group. On Day 1 and Day 10 the two groups were assessed for visual perceptual sensitivity through Critical Flicker Fusion Frequency (CFFF) and degree of illusion. The Yoga group practiced yogasanas, pranayama, kriyas, meditation and bhajans along with specially designed games to improve memory and attention and the control group carried on with their routine activity. Following 10 days of yoga training, the Yoga group

showed a significant increase in CFFF (9.2%) and decrease in degree of illusion (24.89% for in trails and 31.05% for out trails), while the control group showed no change.

Telles, Rajesh and Srinivas (1999) investigated the effects on autonomic and respiratory measures in children with impaired vision following yoga and physical activity programs. They conducted assessments on twenty eight children with impaired vision (VI group), with ages ranging from twelve to seventeen years and in an equal number of age-matched, normal sighted children (NS group). The VI group had significantly higher rates of breathing, heart rates, and diastolic blood pressure values, compared to the NS group (Mann- Whitney U test). Twenty four of the VI group formed pairs matched for age and degree of blindness and were randomly assigned to two groups, viz. yoga and physical activity. Both groups spent an hour each day practicing yoga or working in the garden depending on their group. After 3 weeks, the yoga group showed a significant decrease in breath rate (Wilcoxon on paired signed ranks test). There was no change after the physical activity program. The results showed that the visually impaired have higher physiological arousal than the normal sighted with a marginal reduction in arousal following yoga.

Manjunath and Telles (1999) conducted a study on motivational aspects of improvement in visual perceptual sensitivity in children following yoga training. Yoga has already been shown to improve perceptual-motor skills, but the factors which influence its effects were not well defined. This study correlates age, gender and motivation to learn yoga with the performance in a dexterity task following yoga. Tweezer dexterity was recorded in eighty subjects belonging to four groups. Two groups were given a month of yoga training. One group consisted of subjects who had

volunteered to join for the training and the other group was deputed for the training as part of their job. The two remaining groups did not receive any yoga training and were selected to match the respective groups receiving yoga, for age and sex, but not for their motivation to learn yoga. The test involved using a tweezer to place metal pins in evenly spaced holes in a metal plate within four minutes. Following yoga the scores of the volunteers who learnt yoga increased significantly, whereas there was no change in scores of deputed subjects and non-yoga groups. For reasons described in detail, factors such as age and gender did not appear to contribute to the difference in performance. Hence motivation to learn yoga appeared to influence the magnitude of increase.

Raghuraj et.al (1998) conducted a study on the effect of two selected yogic breathing techniques on heart rate variability. The heart rate variability (HRV) is an indicator of the cardiac autonomic control. Two spectral components were recorded, viz. high frequency (0.15- 0.50 Hz), which was due to vagal efferent activity and a low frequency component (0.05- 0.15 Hz), due to sympathetic activity. The study was conducted to find the effect on HRV during two yoga practices which had been previously reported to have opposite effects, viz, sympathetic stimulation (kapalabhati, breathing at high frequency, i.e., 2.0 Hz) and reduced sympathetic activity (nadisuddhi, alternate nostril breathing). Twelve male volunteers (age between 21 to 33 years) were assessed before and after each practice on separate days. The electrocardiogram (lead 1) was digitized on line and off line. The results showed a significant increase in low frequency (LF) power and LF/HF ratio while high frequency (HF) power was significantly lower following kapalabhati. There were no significant changes following nadisudhi. The results suggested that kapalabhati

modifies the autonomic status by increasing sympathetic activity with reduced vagal activity. The study also suggested that HRV is a more useful psycho physiological measure than heart rate alone.

Telles et.al (1997) investigated the effect of a combination of focusing and defocusing through yoga practice on optical illusion. The degree of optical illusion was assessed using standard Muller- Lyer lines on two groups (yoga and control) of thirty subjects each having age between eighteen and forty two years . The difference between the reading at which the lines were actually equal and the reading at which the subject felt them to be equal was noted as the degree of illusion. Each subject was assessed at the beginning and at the end of a month. During the training period the yoga group received training in yoga, while the control group carried on with their usual routine. At the end of the month the yoga group showed a significant decrease in the degree of illusion (86%), whereas the control group showed no change. The improvement following yoga could he attributed to the combination of focusing and defocusing involved in yoga practice, as these factors are known to influence the degree of illusion. Previous studies have found a 79% decrease in degree of illusion with focusing alone.

Vani et.al (1997) investigated on the progressive increase in Critical Flicker Fusion Frequency following yoga training. The Critical Flicker Fusion Frequency (CFF) is the frequency at which a flickering stimulus as perceived to be steady, with higher values suggesting greater perceptual accuracy. The CFF was measured in two age-matched groups of 18 healthy male volunteers whose age ranged from 25 to 39 years. After baseline assessments one group (yoga group) received yoga training, while the other group (control group) carried on with their routine activities. Yoga

practices included asanas, pranayamas, kriyas, meditation, devotional sessions and lectures on the theory of yoga. After 10 days neither group showed any change in CFF. However, after 20 days and 30 days the yoga group showed significant increases in CFF by 11.1 % and 14.9% respectively while, the control group showed no change after 20 days and 30 days.

Wann (1997) discusses about a relationship between sport aggression and performance in a very close perspective and have quoted some relevant studies to support the notion that aggression will be detrimental to athletic performance. Firstly, as the athletes focus their attention toward harming their opponent their attention to the task reduces. The result of the reduced focus attention is a cause of reducing the performance. Secondly, the arousal accompanying the display of aggression may push the athlete beyond his or her optimal level. Again, the result will be a reduction in performance.

Telles et.al (1997) conducted a study on comparison of changes in autonomic and respiratory parameters of girls after yoga and games at community home setting. The heart rate, breathing rate and skin resistance were recorded for 20 community home girls (home group) and for 20 age-matched girls from a regular school (school group). The former group had a significantly higher rate of breathing and a more irregular breath pattern known to correlate with high fear and anxiety than the school group. Skin resistance was significantly lower in the School group, which may suggest greater arousal. 28 girls of the home group formed 14 pairs, matched for age and duration of stay at home. Subjects of a pair were randomly assigned to either yoga or games groups. For the former, emphasis was on relaxation and awareness, whereas for the latter increase in physical activity was emphasized. At the end of an

hour daily programme for six months both groups showed a significant decrease in the resting heart rate relative to initial values and the yoga group showed a significant decrease in breath rate, which appeared more regular but no significant increase was found in the skin resistance. The results suggested that a yoga program which includes relaxation, awareness and graded physical activity is a useful addition to the routine of community home children.

Telles et.al (1997) conducted a study on muscle power dexterity skill and visual perception in common home girls trained in yoga and sports in regular school girls. The study was conducted to compare critical flicker fusion frequency (CFF), degree of optical illusion ('di'), dexterity and grip strength in three groups of subjects, viz community home girls who had learned yoga for 6 months (CHY), and girls-matched community home girls who had physical activity training for 6 months (CHP), and girls who were attending a regular school (SCH). There were equal numbers in each group for each of the 4 assessment (range 11 to 30 subjects) and age range was from 12 to 16 years. The CHP group had significantly lower CFF whereas 'di' was found to be significantly higher (one factor ANOVA-test for unpaired data), when both were compared to CHY and SCH groups. Right hand grip strength was also significantly less in the CHP group compared to SCH group. The results were explained by previous reports of high levels of anxiety and aggression in community-home groups, which was known to influence the four parameters described here. The better performance of the CHY group when compared to CHP, suggest that yoga practice has a beneficial effect in these subjects.

Telles, Nagarathna and Nagendra (1995) studied on the improvement in visual perception following Yoga training. Visual discrimination was tested in two

groups of 18 College students each, with ages ranging from 17 to 22 years. One group had 10 days of training in yoga, including asanas (physical postures), pranayama (voluntary regulation of breathing), tratakas (visual focusing exercises), meditation and lectures on the theory of yoga. The control group carried on with their routine activities. The ability to detect intermittent light of fixed luminance, at varying frequencies was tested in both groups at the beginning and at the end of 10 days. The pre test means were found to be similar for both groups. After 10 days, the frequency at which the yoga group was able to detect the flickering of the stimulus, was significantly more than the initial values (Wilcoxon's paired signed ranks test), whereas the control group showed no significant change.

Telles et.al (1994) conducted a study on plasticity of motor control systems demonstrated by yoga training. The static motor performances were tested on two groups with 20 subjects each with age ranging from 17 to 22 years and with 5 females in each group). Tests were carried out at the beginning and end at the end of a 10 day period; The test was the ability to insert and hold a metal stylus within holes of varying sizes for 15 sec. Accidental contacts between the stylus and the sides of the holes, were registered on a counter as errors. For 10 days, one group (the Yoga group) practiced asanas (physical postures), pranayama (voluntary regulation of breathing), meditation, devotional sessions, and tratakas (visual focusing exercises), which the control group followed their usual routine. After 10 days the Yoga group showed a significant reduction in the number of errors (Wilcox one paired signed ranks test), while the control group were found not to have any change. Their earlier study also showed a similar improvement in children of 9 to 13 years of age.

Telles et.al (1993) conducted a study on Physiological changes in sports teachers following 3 months of training in yoga. The study was conducted to assess whether yogic training of the same duration (3 months) will make any physiological changes in 40 male Physical Education teachers whose ages were between 25 and 48 years (34.7 + 5.9). Three months of yoga training were given to the subjects and consisted of practice of different asanas (physical postures), Pranayamas (voluntary regulation of breathing), meditation, devotional sessions and lectures on the theory and philosophy of yoga. In addition, special emphasis was given to their grasping the total approach of yoga to bring about eye sight improvement, voice culture, enhancement of physical stamina, memory, creativity, emotional culture, I.Q., Spiritual and personality development. The yoga practices were as follows. (1) Asanas: (a) Those performed when standing – ardhakati chakrasana, trikonasana and padahasthasana. (b) Those performed when sitting – vajrasana, padmasana, yoga mudra, ustrasana, sasankasana, ardha matsyendrasana, paschimotanasana and suptavajrasana. (c) Those performed in the prone position were bhujangasana, dhanurasana, and relaxation in makarasana. (d) Asanas performed in the supine position - sarvangasana, matsyasana, halasana and relaxation in shavasana. Usually asanas were performed between 5.30 am and 7.00 am everyday. (2) Pranayama practices included initial cleansing (kapalabhati) followed by sectional (i.e. clavicular, thoracic and abdominal) breathing, full yogic breathing and nadisudhi pranayama. Pranayama was practised between 11 am and 12 noon, daily. (3) Kriyas or cleansing practices such as jala neti, sutra neti and vamana dhouti were practised two times a week. Also eye exercises (tratakas) intended to 'cleanse' the eyes and improve vision were practised for 20 min everyday. (4) Meditation was silent mental chanting of the

syllable "OM" for about 15 minutes. Besides, 60 min everyday 'cyclic meditation' was also carried out. This actually is based on 'stimulation followed by relaxation', and at the end of the practice the subject lies in shavasana (with instructions) to experience higher levels of expansion. (5) Devotional Sessions with singing bhajans, for 60 min daily. (6) Lectures usually 2 lectures per day, 60 min each. The results of the study showed a significant reduction in heart rate, BP, blood glucose, plasma cholesterol, dopamine B hydroxylase, monoamine oxidase and an increase in mean skin temperature, and alpha index of EEG and an increased level of urinary 17-keto steroids. These changes were interpreted as a shift in autonomic equilibrium towards parasympathetic dominance.

Shirley et.al (1993) studied on improvement in static motor performance following yogic training of school children. Two groups of 45 children each, whose age ranged from 9 to 13 years, were assessed on a steadiness test, at the beginning and again at the end of a 10-day period during which one group received training in yoga, while the other group did not have had any type of training. The steadiness test required insertion and holding for 15 seconds a metal stylus without touching the sides of holes of decreasing sizes in a metal plate. The contacts were counted as errors during the 10-day period, one group (the 'Yoga' group) received training in special physical postures (asanas) voluntary regulation of breathing (pranayama), maintenance of silence, as well as visual focusing exercises (tratakas) and games to improve the attention span and memory. The other group (control) carried out their usual routine. After 10 days, the yoga group showed a significant (Wilcoxon's paired signed-ranks test) decrease in errors, whereas the 'Control' group showed no change.

Telles and Desiraju (1993) conducted a study on autonomic changes in Brahmakumaris Raja yoga meditation in the Department of Neurophysiology, National Institute of Mental Health and Neurosciences, Bangalore. The study presented the changes in various autonomic and respiratory variables during the practice of Brahmakumaris Raja Yoga meditation. Eighteen males in the age range of 20 to 52 years (mean 34.1 ± 8.1), with 5-25 years of experience in meditation (mean 10.1 ± 6.2), participated in the study. Each subject was assessed in three test sessions, which included a period of meditation, and also in three control (non-meditation) sessions, which included a period of random thinking. Group analysis showed that the heart rate during the meditation period increased when compared to the preceding baseline period, as well as when compared to the value during the non-meditation period of control sessions. In contrast to the change in the heart rate, there was no significant change during meditation, for the group as a whole, in palmar GSR, finger plethysmogram amplitude, and respiratory rate. On an individual basis, changes which met the following criteria were noted: (1) changes which were greater during meditation (compared to its preceding baseline) than changes during post meditation or non- meditation periods (also compared to their preceding baseline); (2) Changes which occurred consistently during the three repeat sessions of a subject and (3) changes which exceeded arbitrarily chosen cut- off points (described at length below). This individual level analysis revealed that changes in autonomic variables suggestive of both activation and relaxation occurred simultaneously in different subdivisions of the autonomic nervous system in a subject. Apart from this, there were differences in patterns of change among the subjects who practiced the same meditation. Hence, a

single model of sympathetic activation or overall relaxation may be inadequate to describe the physiological effects of a meditation technique.

Telles et.al (1992) studied on the alterations of auditory middle latency evoked potentials during consciously regulated yogic breathing and attentive state of mind in the Department of Neurophysiology, National Institute of Mental Health and Neuro Sciences, Bangalore (India). Middle latency auditory-evoked potentials (AEP-MLRs) of 10 healthy male subjects in the age range of 21-33 years, were assessed to determine whether yogic pranayama practice would cause changes in them. The pranayama type assessed here is an exercise of consciously-controlled rhythmic breathing involving timed breath-holding in each cycle of breathing, while the subject holds utmost attention and experiences the touch of inhaled air in the nasal passage. The results revealed that the Na-wave amplitude increased and latency decreased during the period of pranayama practice, whereas the Pa-wave was not significantly altered. The change is interpreted as an indication of a generalized alteration caused in information processing at the primary thalamo-cortical level during the concentrated mental exercise of inducing modifications in neural mechanisms regulating a different functional system (respiratory).

Prapavessis et.al (1992) used a single-subject research design to test the effectiveness of a cognitive-behavioral intervention in reducing state anxiety and improving sport performance. The subject was a small-bore rifle shooter who suffered from high levels of competition-related anxiety. Initially, self-report, physiological, and behavioral measures of baseline state anxiety were obtained during competition. A 6-week intervention program was then implemented. This program included training in relaxation, thought stoppage, refocusing, coping statements and

biofeedback. An opportunity to practice using these procedures in competition was provided. Measures of state anxiety and performance were then obtained in a second competition. Results revealed that cognitive anxiety, somatic anxiety, gun vibration, and urinary catcholamines decreased whereas self-confidence and performance increased from baseline to treatment.

Telles and Desiraju (1992) studied on heart rate and respiratory changes accompanying yogic conditions of single thought and thoughtless states in the Department of Neurophysiology National Institute of Mental Health and Neuro Sciences, Bangalore. The study revealed that certain yogis can alter the patterns of their cardiovascular functions voluntarily. The subject was a 76 year old healthy and active male at the time of the study and have practiced yoga of thoughtless state for many years. Later the heart rate and respiratory changes associated with states of thought control have been recorded after obtaining consent. Informed consent was obtained from the subject for the study. There was a significant increase in heart rate during the 'single thought' state compared to the baseline (eyes closed *sukhasana*), and a further increase during the 'no thought' In contrast, the changes in respiration were different for the 2 states: during 'single thought' state there was an increase in rate and regularity of respiration, whereas during the 'no thought' state there was a significant reduction in the rate. Apart from that, although the respiratory changes are in opposite directions, the heart rate changes are found to be in the same direction.

Vempati and Telles (1992) studied on yoga based guided relaxation on sympathetic activity, at the Vivekananda Kendra Yoga Research Foundation, Bangalore, 40 male volunteers of ages ranging from 20 to 46 years were studied on two sessions, of yoga based guided relaxation and supine rest. Assessments of

autonomic parameters were made in 15 subjects before, during and after the practices, whereas oxygen consumption and breath volume were recorded in 25 subjects, before and after both types of relaxation. A significant decrease in oxygen consumption and increase in breath volume were recorded after guided relaxation (paired t test). There were comparable reduction in heart rate and skin conductance level during both types of relaxation. During guided relaxation the power of the low frequency component of the heart rate variability spectrum reduced, whereas the power of the high frequency component increased, suggesting reduced sympathetic activity. Also subjects with a base line ratio of LF/HF >0.5 showed a significant decrease in the ratio after guided relaxation, while subjects with a ratio < 0.5 at baseline showed no such change. The results suggest that sympathetic activity decreased after guided relaxation based on yoga, depending on the base line levels.

Abaian and Roy (1990) conclude after an experimental study that the psychological preparation and psychic state of the national weight lifting team, that stress before start is a necessary component for a good result. But it must exist at an optimum level. If the nervousness increase the psychological tension transfer into apathy and it would be late to help the athlete. High emotional arousal violates balance of optimum level of functional system resulting in not achieving the goal.

Despande, Sharma and Shattiwar (1981) studied on yogic and ayurvedic treatment on chronic colitis. The study revealed that severe and long standing ulcerative colitis has been cured or effectively controlled by a daily programme of specific asanas, including shavasana, together with ayurvedic treatment and dietary modification, in a controlled study in the Department of Ayurvedic Medicine Banaras Hindu University, Varanasi.

Puente and Beiman (1981) studied on the effects of behaviour therapy, self relaxation and transidential meditation on cardiovascular stress response. The study has been found to relieve the fundamental cause of cardiac strain and heart attack by reducing the load of environmental and intrapsychic stress being relayed from the hypothalamus into the electrical conducting fibres of the heart via the sympathetic nervous system and as a result heart rate, blood pressure and work load on the cardiovascular muscles are reduced.

Carrington et.al (1980) suggested after their study the use of meditation relaxation technique for the management of stress in a working population. It was also found out that Yoga Nidra plays an important role in the field of rehabilitation and in geriatrics with intractable pain, loss of motivation and in those with psychological depression pose major barriers in conventional treatment. The study also suggested that Yoga Nidra has its most wide spread application as a preventive measure, to be practiced by healthy, active people as a means of relieving accumulated tensions, increasing stress resistance and overall efficiency and preventing the development of psychosomatic diseases.

Shealy (1980) studied on the effectiveness of various treatment techniques in different degrees of sleep-onset insomnia. The study revealed that Yoga Nidra is a successful treatment for insomnia. The patients of insomnia who practiced Yoga Nidra at bedtime reported that they usually dropped into sleep at some stage during the practice.

Gupta et.al (1979) studied on the effects of yoga on bronchial asthma. The study was conducted on 27 asthmatic patients in which 18 showed improvement in respiratory function and greater freedom of breathing after intensive training in Yoga

Nidra, pranayama and other yogic kriyas and 63% of patients had definite relaxation and dilation of the bronchial tubes when retested on a spirometer.

Brauer (1979) conducted a study on relaxation therapy for essential hypertension. The finding was that practice of Yoga Nidra lowered the elevated blood pressure levels of hypertensive patients.

Udupa (1977) studied on the pathogenesis and management of stress disorders and suggested that the stress related disorders gradually evolve through four recognizable stages. Initially, psychological changes such as anxiety, irritability and insomnia arise due to over stimulation of the sympathetic nervous system. In the second stage, distinct physical symptoms such as high blood pressure, elevated heart rate or increased intestinal motility appear. In the third stage, a more profound physical and biochemical imbalances sets in and evidence of malfunctioning organs manifests clinically. Finally, detectable and often irreversible lesions appear often with severe symptoms requiring surgical or long term pharmacological management.

Brig, Datey and Bhagat (1977) studied on stress and heart diseases to find out the effect of the relaxation technique biofeedback training and shavasana in patients suffering from hypertension. A total of 27 patients of hypertension were taken up for biofeedback training and 86 for savasana. Their ages varied from 22 to 64 years with an average of 40 years. Their original systolic blood pressure ranged from 160-270 mm Hg and diastolic from 90-145 mm Hg. The average blood pressure was 186/115 mm Hg. These patients were divided into three groups. Group 1 consisted of 15 patients of hypertension. This group had not received any antihypertensive drugs. They were given placebo tablets for one month before teaching shavasana. Group 2 consisted of 45 patients. These patients were on antihypertensive drugs for at least 2

years and their blood pressure was adequately controlled. Group 3 consisted of 26 patients. These patients were on antihypertensive drugs but their blood pressure was not adequately controlled.

Results of the study showed that there was a significant reduction in blood pressure in the biofeedback group as compared to the control group. A total of 21 patients out of the 27 showed a significant reduction in blood pressure. The average mean blood pressure had been reduced from 118 to 103 mm Hg., and after 4 months follow up it was 107 mm Hg. There was no significant change in blood pressure of patients in the control group. A fall of blood pressure was noted in the shavasana group. In the patients of Group 1 the average mean blood pressure came down from 134 to 107 mm Hg. In group 2 the fall in the blood pressure was from 102 to 100 mm Hg but the drug requirement was reduced to 32% of the original in 27 patients. In group 3 the average blood pressure dropped from 120 to 110 mm Hg and the drug requirement was reduced to 2% of the original in 10 patients.

French and Tupin (1974) studied on therapeutic application of a simple relaxation method on the patients suffering from major long term disabilities, at the University of California Medical Centre at Davis, USA. The study revealed that Yoga Nidra is applicable for bedridden, incapacitated and chronically afflicted patients of all degrees. They found that Yoga Nidra improved the lives of the patients in several distinct ways such as

1. Relieving insomnia and sleep disturbances.
2. Maintaining moderate pain outside the field of conscious awareness.
3. Partially relieving feeling of despair and depression, which so often complicate the outlook in chronic disease.

4. Decreasing the requirements for analgesic, hypnotic and sedative drugs.

Patel (1973) conducted a study on yoga and biofeedback in the management of hypertension and found out that Yoga Nidra therapy reduced systolic reading (SBP) by an average of 15-20 MM Hg, and diastolic reading (DBP) by 10 mm Hg after 3 weeks daily guided practice.

Biju Lona K. “Effect of Cyclic Meditation and Yoga Nidra on Selected Physiological and Psychological Variables in College Level Athletes”., Thesis. Department of Physical Education, University of Calicut, 2008.

Chapter III

METHODOLOGY

In this chapter, procedures and methods applied for selection of subjects, selection of variables, criterion measures, reliability of data, experimental design, experimental training programme, collection of data, administration of tests and statistical techniques used are presented.

Selection of Subjects

At the initial stage 114 sports persons under Calicut University have acted as subjects prior to the pre test data collection. After the pre test data collection forty male and forty female sports persons were finally selected as subjects for the study based on their attitude, enthusiasm and interest towards the study shown at the time of pre test data collection. They were then randomly divided into four groups and each group consisted of ten male and ten female sports persons. Group A underwent Cyclic Meditation programme and Group B underwent Yoga Nidra, Group C underwent a combination of Cyclic Meditation and Yoga Nidra while Group D acted as a Control group. The age of the subjects ranged between 17 to 25 years.

Selection of Variables

The five physiological and five psychological variables selected for the study were:-

Physiological Variables

- a) Pulse Rate
- b) Respiratory Rate

- c) Systolic Blood Pressure
- d) Diastolic Blood Pressure
- e) Body Temperature

Psychological Variables

- a) Cognitive Anxiety
- b) Somatic Anxiety
- c) Self Confidence
- d) Instrumental Aggression
- e) Hostile Aggression

Selection of Test and Tools

Competition State Anxiety Inventory (CSAI-2) developed by Martens et al and Inventory for Sports Aggression (ISA) developed by Jayan and Santosh were used to measure the psychological variables and standard medical procedures were used to measure the physiological variables.

The selected variables and their respective tests and instruments used are presented in table 1.

Table-1**LIST OF VARIABLES AND THEIR RESPECTIVE TESTS AND TOOLS**

Sl. No.	Variable	Test and Instruments Used
Physiological Variables		
1	Pulse Rate	Palpation of radial artery at wrist
2	Respiratory Rate	Observing the rise and fall of the chest
3	Systolic Blood Pressure	Sphygmomanometer
4	Diastolic Blood Pressure	Sphygmomanometer
5	Body Temperature	Thermometer
Psychological Variables		
6	Cognitive Anxiety	CSAI-2 Questionnaire
7	Somatic Anxiety	CSAI-2 Questionnaire
8	Self Confidence	CSAI-2 Questionnaire
9	Instrumental Aggression	ISA Questionnaire
10	Hostile Aggression	ISA Questionnaire

Criterion Measures

The criterion measures for the selected physiological variables were :-

- 1) Pulse Rate was recorded in numbers.
- 2) Respiratory Rate was recorded in numbers.
- 3) Body Temperature was recorded in degree Fahrenheit.

- 4) Systolic Blood Pressure was recorded in millimeter of mercury (MM Hg).
- 5) Diastolic Blood Pressure was recorded in millimeter of mercury (MM Hg).

Reliability of Data

Reliability of data was ensured by the instrument reliability, competency of the tester and subject's reliability.

Instrument Reliability

Thermometers, Sphygmomanometer and Stop watch used in this study for measuring the physiological variables were procured from reliable standard companies and were considered accurate enough for the purpose of the study. Standardized Questionnaires were used to measure the psychological variables.

Competency of the Tester

The scholar has undergone training under an expert to collect data on the selected physiological variables. To measure the competency of the tester, data was collected on ten subjects on the selected variables by the scholar and correlated with the data taken by an expert, as very high correlations were found the scholar was ascertained to be competent. The coefficient of correlation was used to ascertain competency of the tester and is presented in table 2.

Table-2**COEFFICIENT OF CORRELATION DONE ON TEST RETEST SCORES TO ASCERTAIN THE COMPETENCY OF THE TESTER**

Sl. No.	Tests, Methods and Instruments Used	Variables Measured	Coefficient of correlation
1	Palpation of radial artery at wrist	Pulse Rate	0.94*
2	Observing the rise and fall of the chest	Respiratory Rate	0.93*
3	Sphygmomanometer	Systolic Blood Pressure	0.95*
4	Sphygmomanometer	Diastolic Blood Pressure	0.92*
5	Thermometer	Body Temperature	0.96*
6	CSAI Questionnaire	Cognitive Anxiety	0.96*
7	CSAI Questionnaire	Somatic Anxiety	0.95*
8	CSAI Questionnaire	Self Confidence	0.94*
9	ISA Questionnaire	Instrumental Aggression	0.97*
10	ISA Questionnaire	Hostile Aggression	0.91*

* Significant at 0.01 level of confidence as the required value is 0.77

Since the obtained 'r' values were much higher than the required value, the data collected by the tester for this study were ascertained as reliable.

Subject's Reliability

Test and Retest method was followed in order to establish subject's reliability. Taking ten subjects at random, all the variables selected for the present study were tested twice on the subject by the investigator under similar conditions on two different days. The coefficient of correlation was found to find out the subject's reliability and are presented in table 3.

Table-3**COEFFICIENT OF CORRELATION DONE ON TEST RETEST SCORES TO ASCERTAIN SUBJECT'S RELIABILITY**

Sl. No.	Tests and Instruments Used	Variables Measured	Coefficient of correlation
1	Palpation of radial artery at wrist	Pulse Rate	0.97*
2	Observing the rise and fall of the chest	Respiratory Rate	0.97*
3	Sphygmomanometer	Systolic Blood Pressure	0.94*
4	Sphygmomanometer	Diastolic Blood Pressure	0.95*
5	Thermometer	Body Temperature	0.96*
6	CSAI Questionnaire	Cognitive Anxiety	0.91*
7	CSAI Questionnaire	Somatic Anxiety	0.95*
8	CSAI Questionnaire	Self Confidence	0.94*
9	ISA Questionnaire	Instrumental Aggression	0.96*
10	ISA Questionnaire	Hostile Aggression	0.96*

*Significant at 0.01 level of confidence as the required value is 0.77

Since the obtained 'r' values were much higher than the required value, the test scores collected for the study given by the subjects were ascertained as reliable.

Experimental Design

The random group design was used as the experimental design for this study. The subjects selected for this study were randomly divided into four groups such as three experimental training programme groups and a control group.

Experimental Training Programme

Orientation of the subjects

The investigator explained the purpose of the study and the importance of the training programme to the subjects, requesting their cooperation for the successful completion of the study. A few days were spent to teach the meditation techniques involved in the training prior to the commencement of the training programme.

Training Schedule

The three experimental groups A, B and C were assigned Cyclic Meditation, Yoga Nidra and Combined Meditation (combination of Cyclic Meditation and Yoga Nidra) respectively for a duration of twelve weeks with three sessions in a week, while Group D served as a Control group and was not given any specific meditation programme.

Group A was given Cyclic Meditation programme consisting of three relaxation programme such as Instant Relaxation Technique (IRT), Quick Relaxation Technique (QRT) and Deep Relaxation Technique (DRT) besides, seven *asanas* such as Tadasana, Ardhakati Chakrasana, Pada Hastasana, Ardha Chakrasana, Vajrasana, Sasankasana and Ustrasana three times in a week.

Group B was given Yoga Nidra consisting of Resolve, Rotation of consciousness, Awareness of breath, Feeling and sensations and Visualization three times in a week.

Group C was given Cyclic Meditation and Yoga Nidra alternatively three times in a week.

The subjects were requested not to involve in any specific relaxation, or meditation programme other than this training programme. The subjects underwent their respective training programme under the strict supervision of the research scholar. All the subjects involved in the meditation programme were enquired about their stature, mood and health. None of them reported any difficulties or discomfort during the training period.

Cyclic Meditation

Instructions before the practice

Before the practice of Cyclic Meditation the following instructions were given regarding the performance of asanas. They were asked to perform the asanas very slowly in normal breathing without any jerks. They were instructed not to do forceful stretching in asanas and practice with closed eyes. They were also instructed not to do with strain and give strenuous attention to any of the practice.

Sequence and Techniques of Cyclic Meditation

Please sit down comfortably. Adopt any comfortable sitting posture. We are going to do Cyclic Meditation. Let us begin with a prayer. As you repeat the prayer, feel the resonance throughout the body. Adopt *namaskar mudra* (Folded hands at front).

'laye sambodhayet chittam, Vikshiptham samayet punah

Sakasayam vijaneeyat Samapraptham na jalayet'.

Slowly lie down and relax on the floor. Come to *Savasana*. Lie on your back. Legs apart. Hands apart. Palms facing the ceiling. Smiling face. Let all parts of the body relax on the floor.

Step 1 Relaxation– Instant Relaxation Technique (IRT)

Now we are going to do the first set of relaxation that is IRT. Legs together. Join the heels. Toes together. Palms by the sides of the thighs. According to my instruction you are going to tighten all parts of your body from toes to head.

Bring your attention to your toes. Tighten your toes. Tighten your ankle joints. Tighten your calf muscles. Tighten your thigh muscles. Tighten and squeeze your buttocks. Breathe out and tuck your abdomen inwards. Make a fist of your hands and tighten the arms. Inhale and expand your chest. Tighten your facial muscles. Tighten the whole body from toes to head. Tighten. Tighten. Tighten.

R e l a x ...Legs apart. Arms go apart. Palms facing upward. Assume the most comfortable position of the head. Let the whole body sink down. Let all groups of muscles completely relax. Enjoy relaxation.

Now slowly rotate the left arm along the ground upwards. Left arm going up. Slowly turn to your left side. Place the head on the left arm. Place the right leg on the left leg. Place the right palm on the right thigh. Let the whole body relax. The entire weight of the body may come down to the ground through the left side. Feel the linear awareness.

Now with the help of both hands, slowly come to long sitting position. Slowly start coming up to *tadasana*. Let all the movements be slow. Let the breathing be

deep, slow, and continuous. Eyes closed. Carefully feel the changes in your body as you reach the vertical position. Feel the flow of blood down the head. Feel the heart beat and the pulse.

Centering

Now let us do centering. Slowly lean forward. Feel the weight of the entire body on the toes and pointed awareness. Come to centre. Slowly lean backwards. Feel the weight on the heels and surface awareness. Come to the centre. Lean to the right. Bring the whole weight of the body to the edge of the right foot and feel the linear awareness. Come to the centre. Now shift your body weight to the edge of the left foot and feel the linear awareness. Come to the centre. Feel surface awareness. Let the whole body be centered. The weight distributed equally throughout the soles. Collapse your shoulders. Arms hanging freely down. Smiling face. Feel all the changes going on throughout the body.

Step 2. Stimulation– Standing Asanas

Ardhakati Chakrasana

Now we pass on to the first set of stimulations. We are going to do *Ardhakati Chakrasana*. The lateral arc posture. Slowly start raising the right arm rightwards. Bring to 45 degree angle. Slowly raise your arm upward. Enjoy the movement. As the right arm reaches the horizontal position turn the palm upward. Let the palms face upwards. Now bring to 135 degree angle. Slowly raise your arm further upward. As the right arm reaches the vertical position, feel the beautiful pointed awareness on the right shoulder. Press the right biceps on the right ear and feel the beautiful surface awareness. Have a smiling face. Stretch your complete right side of your body from the tip of the fingers to the hip. Get the entire right portion of the body be stretched,

but not the face. Face always smiling and relaxed. Slowly start bending down to the left from the waist. Left palm sliding down to the left thigh. Feel the surface awareness. Enjoy the fine stretch of the right waist muscles. Feel all the changes going on in your body. Slowly start coming back to the vertical position. Feel the tip of the fingers. Feel the blood flowing down, nerve impulses throughout the body again stretch and pull up the right arm. Now, feel a complete stretch of the right portion of the body. Slowly start bringing down the right arm to 135 degree gliding down smoothly. Feel the pointed awareness on the right shoulder. At the horizontal position slowly turn the palm downwards. Bring down the right arm to 45 degree and further bring it down. Have a glance of the whole body again from toes to head. Now you can feel the entire right portion of the body beautifully charged. Feel light and energized.

Now let us perform *Ardhakati Chakrasana* from the left side. Slowly start raising the left arm leftwards. Bring to 45 degree angle. Slowly raise your arm upward. Enjoy the movement. As the left arm reaches the horizontal position turn the palm upward. Let the palms face upwards. Now bring to 135 degree angle. Slowly raise your arm further upward. As the left arm reaches the vertical position, feel the beautiful pointed awareness on the left shoulder. Press the left biceps on the left ear and feel the beautiful surface awareness. Have a smiling face. Stretch your complete left side of your body from the tip of the fingers to the hip. Get the entire left portion of the body be stretched, but not the face. Face should always be smiling and relaxed. Slowly start bending down to the right from the waist. Right palm sliding down to the right thigh. Feel the surface awareness. Enjoy the fine stretch of the left waist muscles. Feel all the changes going on in your body. Slowly start coming back to the

vertical position. Feel the tip of the fingers. Feel the blood flowing down, nerve impulses throughout the body again stretch and pull up the left arm. Now, feel a complete stretch of the left portion of the body. Slowly start bringing down the left arm to 135 degree gliding down smoothly. Feel the pointed awareness on the left shoulder. At the horizontal position slowly turn the palm downwards. Bring down the left arm to 45 degree and further bring it down. Have a glance of the whole body again from toes to head. Now you can feel the entire left portion of the body beautifully charged with nerve impulses, light and energized. Enjoy the sense of well being. Chant *akara* and feel the resonance throughout the body. AAA... (pause).Feel the fine massaging effect.

Padahasthasana

Now we are going to perform *Padahasthasana*. Slowly start bending forward from the lower back. Let both arms hang freely down. Collapse the shoulders, relax the neck muscles, let the head hang freely down. Now loosen the waist, the entire trunk freely relaxed. Feel the changes in the head and feel the stabilization of blood pressure. Enjoy all the changes going on. Feel the nerve impulses, heartbeat, pulse and synchronization. In the final position chant *makara* and feel the resonance through the head.MMM... (pause). Slowly get up and come back to the vertical position. Carefully follow the changes. Feel the decreased blood pressure in the head region. Feel the whole body, beautifully energized and relaxed.

Ardhachakrasana

Now let us come to the complementary asana of *Padahasthasana*. We are going to perform *Ardhachakrasana*, the back bending posture. Slowly slide the palms along the thigh upward, all fingers together. Turn and support the waist. Fingers

forward. Slowly start bending backwards from the waist. Let the head hang freely down backwards. Do not over stretch. Chant *akara* loudly. AAA... (pause). Feel the resonance throughout the body. Slowly start coming up. Feel the changes in the neck and head region. Slide down the palms. Have a glance of the whole body and relax. Feel the 3-D awareness.

Step 3. Relaxation- Quick Relaxation Technique (QRT)

Sit down and come down to *Savasana*. We are coming to the third part of Cyclic Meditation. After the stimulation we are going to do another set of relaxation, the Quick Relaxation Technique. Recognize abdominal movements. Bring your awareness to the abdominal muscles. Feel the abdominal movements. Abdomen is moving up nicely and coming down. Now synchronize your abdominal movements with breathing. Here, we are associating abdominal movements with breathing. As you inhale, abdominal muscles are coming up and as you exhale, abdominal muscles are going down. Inhale, it goes up, exhale, it goes down, Synchronize the abdominal movements with breathing. Feel the breath all the way from the nostrils down to the lungs. Feel the linear awareness. Do it for 5 rounds (pause).

Now we are synchronizing abdominal movements with feelings. As we breathe in, the abdominal muscles are coming up. Feel the whole body getting energized and light as we breathe out. Let the whole body collapse and sink down nicely, releasing all stresses and tensions completely. Inhale, abdominal muscles coming up, the whole body getting energized and light. Feel the energization with each inhalation and the body becoming free from fatigue and strain as you exhale. Inhale, let all positive emotions arise, exhale, let all negative emotions disappear. Do it for five rounds.

Slowly come up straight with the support of the elbows. Let all the movements be slow and continuous without any breaks. Legs apart, take the support of the palms by placing it behind the body. Come to the leg stretched, relaxed position, relax your neck muscles, the head hanging freely down backwards. Feel the changes going on due to the change in orientation.

Step 4. Stimulation– Sitting Asanas

Now we are going to do another set of stimulation

Vajrasana

Now we pass on to the next set of stimulation with *Sasankasana* and *Ustrasana*. Slowly fold the right leg backwards and then the left leg, coming to the *Vajrasana* position. Palms on the thighs. Spine erect. Enjoy the effect of harmonizing the beautiful balance. Recognize all the changes in the body.

Sasankasana

Now slowly start taking the arms backwards. Hold the right wrist with the left palm. Start feeling the pulse, feel the heart beat. Now slowly start moving forward down for *Sasankasana*. The abdominal muscles pressing on the thigh muscles; beautiful surface awareness. Now collapse the forehead on the ground. Feel the fine surface awareness. Collapse the shoulders. Feel all the changes going in, the increased flow of blood into the head. Relax and chant *makara* MMM... (pause). Feel the resonance throughout the head. Slowly start coming up, back to *Vajrasana*, carefully follow all the changes in the head region and feel the flow of blood in the head region. The whole body becoming light and energized. Feel the heart beat, the synchronization; fine 3-d awareness throughout the body. Slowly bring the arms forward, place them on the thighs near to the knees.

Ustrasana

Slowly rise up to stand on the knees for *Ardha Ustrasana*, the back bending camel posture. Stand on the knees, feel all the changes in the head region. Slowly slide the palms along the thighs, fingers together; support the waist with the palms. Slowly start bending backward with the waist, as a support and hinge. Relax the neck muscles; head hanging freely down. Make the thighs straight, beautifully stretch up the thoracic muscles and loosen the neck joints. This is *Ardha Ustrasana*. Now slowly come to *Ustrasana*, by holding the hands at the ankles. Have a smile on the face. Inhale and chant *akara. AAA...* (pause). Slowly return. Feel the nerve impulses throughout the body, especially in the neck region. Feel the heartbeat and synchronization. Slowly come back to *Vajrasana*. Feel all the changes and let the changes continue. Feel the 3 D awareness throughout the body. Unfold the right leg and the left. Assume the leg-stretched position. Head hanging freely backward, neck loosened now; slowly go back to *Savasana*, slide if necessary with the support of the elbow.

Step 5. Relaxation- Deep Relaxation Technique (DRT)

After the stimulation, we are going to do the Deep Relaxation Technique, the last part of Cyclic Meditation. Legs apart. Arms apart. Palms facing the ceiling. Let the whole body collapse on the ground.

First phase – From toes to waist

Relax your toes; sensitize your soles; feel the nerve impulses; loosen the ankle joints; pointed awareness. Relax the calf muscles. Slightly pull the knee caps and release; collapse the buttock muscles. The whole body sinks down by millimeters; feel the body lying on the floor. Feel surface awareness. Loosen the waist joints.

Beautifully relax the entire body from the toes to the waist. Inhale fully and chant *akara* and generate resonance in the lower part of the body. Inhale. AAA... (pause).

Second phase – From waist to neck

Feel the abdominal and thoracic muscles coming up as you inhale, and the whole body getting energized and light; and as you breathe out, the abdominal and thoracic muscles are beautifully getting relaxed and collapse. Let the whole body sink down; release all the stresses and tensions completely. All the muscles of the back beautifully collapsed down, sinking into the floor. Direct your attention to the spine, the lower-most part, the coccyx region. Let all the muscles surrounding the coccyx be relaxed. Move along the spine upwards to the lumbar – sacral region. Feel the relaxation of all the muscles surrounding the lumbar vertebrae. As you take your attention to the lumbar region, feel the lumbar vertebrae. Let attention slowly move along the spine upwards from the waist to the neck to the dorsal vertebrae. Move step by step, smoothening the nerves, relaxing the muscles, balancing the whole system. Let the whole back collapse down completely. All the nerves beautifully smoothened. Collapse the shoulder blades and the shoulder joints. Relax the arms, the biceps and triceps, the elbow joints forearms and muscles, wrist joints, palms and fingers of the palms. The whole body below the neck is beautifully relaxed. Chant *ukara* and feel the resonance generating throughout the body. Inhale. UUU... (pause).

Third phase – Head

Now bring your awareness to head region. Go deeper and deeper into the head region. Let the chin and the cheek muscles be relaxed. Your cheek muscles are relaxed. Relax your eyes. Relax your foreheads. Relax your temple. Now relax your

head. Relax all parts of the head. Relax the entire head region. Now chant *makara*.

Spread resonance in the entire head.

Inhale ...MMM... (pause).

Fourth phase – Head

Now we are reaching the fourth phase of Deep Relaxation Technique. Relaxing the whole body. Totally relax. Relax the whole body from toe to head. Relaxing each and every systems and organs of the body. No tension. Deep awareness. Generate resonance from toe to head. Let all parts of the body be relaxed. Relax (pause).Totally relax. (pause).

Fifth phase – Head

Now we are reaching the fifth phase of the Deep Relaxation Technique. The state of bliss, creativity and freedom. This is the state of body apartments. Slowly come out from the body. Now you look from the ceiling of the room to your body. Your body is comfortably lying on the floor. Now slowly you are moving up. Moving up and up to the sky. You are enjoying the freedom. You expand along with sky. Now slowly come back straight to your body. Slightly move your head and hands. Now slowly come back to sitting posture. Take deep breath and relax slowly. Sit in *Vajrasana* or sit in any comfortable sitting posture. Adopt *Namaskar Mudra*. Chant closing prayer.

“Sarwe bhavanthu sukhinaha. Sarwe sandhu niramaya

Sarwe Badrani pashyendhu, Ma kachith dhukhabarbhaved.

Om shanthi shanthi shanthi”

Gently massage your face with your palms. Open your eyes with a beautiful smile on your face. The duration for the practice was 45 minutes.

Yoga Nidra

Instructions before the practice

Before the practice of Yoga Nidra the following guidelines were given. They were instructed to do the total practice with closed eyes. They were also instructed to develop awareness throughout the practice without sleep.

Sequence and techniques of Yoga Nidra

Preparation

Please get ready for Yoga Nidra. Lie down on your back on the floor and come to *Savasana*. In this position the body should be straight from head to toe, the legs slightly apart and the arms a little away from the body, with the palms of the hands turned upwards. (pause). Adjust everything, your body, position and clothes, until you are completely comfortable. During Yoga Nidra there should be no physical movement. (pause). Close your eyes and keep them strictly closed until you are told to open them. Take a deep breath and as you breathe out feel the cares and worries of the day flow out of you. (pause). In the practice which follows you are going to develop the feeling of relaxation in the body. It is not necessary to make movements or deliberately relax your muscles, simply develop the feeling of relaxation. (pause). It is like the feeling you have just before sleep... when relaxation becomes deep, sleep does come but you should try to keep yourself completely awake, this is very important. Make a resolution to yourself now that 'I will not sleep, I will remain awake throughout the practice'. (pause). During Yoga Nidra you are functioning on the levels of hearing and awareness and the only important thing is to follow the voice of the instructor. (pause) Allow yourself to become calm and steady... (pause).

Relaxation

Now bring about a feeling of inner relaxation in the whole body. Concentrate on the body and become aware of the importance of complete stillness. (pause). Develop your awareness of the body from the top of the head to the tip of the toes and mentally repeat the mantra O-o-o-m-m-m. (pause). Complete stillness and complete awareness of the whole body... again ... O-o-o-m-m-m, (pause). Continue your awareness of the whole body...the whole body...the whole body. (long pause) Become aware of the fact that you are going to practice Yoga Nidra... Say mentally to yourself, 'I am aware... I am going to practice Yoga Nidra... repeat this to yourself again. (pause) The practice of Yoga Nidra begins now.

Resolve

At this moment make yourself resolve. (pause). The resolve will have to be very simple... and mentally repeated three times with awareness, feeling and emphasis (pause)

I will be successful in my life. I will be successful in my life. I will be successful in my life. The resolve you make during Yoga Nidra will come true in your life. (pause).

Rotation of consciousness:

You can now begin rotation of consciousness, rotation of awareness by taking a trip through the different parts of the body. As quickly as possible the awareness has to go from part to part. Repeat the part in your mind and simultaneously become aware of that part of the body. Keep yourself alert but do not concentrate too intensely. Become aware of the right hand. (pause). Right Side: Right hand thumb, second finger, fifth finger, palm of the hand, become aware of your palm, back of the

hand, the wrist, the lower arm, the elbow, the upper arm, the shoulder, the armpit, the right waist, the right hip, the right thigh, the knee cap, the calf muscle, the ankle, the heel, the sole of the right foot, the top of the foot, the big toe, second toe, third toe, fourth toe, fifth toe...Left Side: Become aware of the left hand thumb, second finger, third finger, fourth finger, fifth finger, palm of the hand, back of the hand, the wrist, the lower arm, the elbow, the upper arm, the shoulder, the armpit, the left waist, the left hip, the left thigh, the knee cap, the calf muscle, the ankle, the heel, the sole of the left foot, the top of the foot, the big toe, second toe, third toe, fourth toe, fifth toe... Back: Now to the back. Become aware of the right shoulder blade, the left shoulder blade... The right buttock, the left buttock...The spine ...The whole back together... Front: Now go to the top of the head. the forehead, both sides of the head, the right eyebrow, the left eyebrow, the space between the eyebrows, the right eyelid, the left eyelid, the right eye, the left eye, the right ear, the left ear, the right cheek, the left cheek, the nose, the tip of the nose, the upper lip, the lower lip, the chin, the throat, the right chest, the left chest, the middle of the chest, the navel, the abdomen...Major Parts: The whole of the right leg... The whole of the left leg... Both legs together (pause) .The whole of the right arm... The whole of the left arm... Both arms together. (pause). The whole of the back, buttocks, spine shoulder-blades... the whole of the front... together...The whole of the head.... The whole body together... The whole body together ... the whole body together. Repeat one or two rounds gradually decreasing speed. Please do not sleep... Total awareness... no sleeping no movement. (pause) .The whole body on the floor, become aware of your body lying on the floor (pause) . Your body is lying on the floor. See your body lying perfectly still on the floor in this room. (pause) .Visualize this image in your mind. (Long pause).

Awareness of Breathing, Feeling and Sensation

Be aware of your breath (pause). Feel the flow of your breath in and out of your lungs. (pause). Do not try to change the rhythm. Breath naturally and automatic... You are not doing it, there is no effort. (pause). Minimum awareness of your breath continue... complete awareness of breath (long pause). Now concentrate your awareness on the movement of your navel area... Concentrate on your navel movements. (pause). Your Navel is rising and falling slightly with every breath, with each and every breath it expands and contracts... Concentrate on this movement in synchronization with your breath (pause) Go on practicing, but be sure that you are aware (Long Pause). Now start counting your breaths backwards from 9 to 1, like this, 9 navel rising, 9 navel falling, 8 navel rising, 8 navel falling, 7 navel rising, 7 navel falling and so on. Say the words and numbers mentally to yourself as you count your breaths. (pause). Be sure that you don't make a mistake. (long pause). You are counting with total awareness. Go on counting from 9 to 1 (long pause) keep on with the practice...No mistakes. (Long pause). Stop counting of the chest breaths and now move your awareness to the throat, please move to the throat. (pause). Be aware of your breath moving in and out of the throat... Be aware of this. (pause) Concentrate on the movement of the breath and start counting backwards from 9 to 1 in the same way as before... Complete awareness of counting and the breath. (long pause) No sleeping please, just total awareness that you are counting. (long pause) Keep on with the practice, continue counting your breaths in the throat. (long pause). Stop counting and go now to the nostrils... Become aware of the breath moving in and out of the nostrils. (pause) Concentrate on the movement of the breath in and out of the nostrils and start counting as before, you know it very well by now, 9 breathing in, 9

breathing out. (long pause). Feel the complete awareness, continue, no mistake.

(long pause) Keep on with the practice, continue. (long pause).

Image Visualization

Stop your counting and leave your breathing... Now come to visualization.
 (pause) A number of different things will be named and you should try to develop a vision of them on all levels... Feelings, awareness, emotion, imagination, as best as you can... (pause) If you are able to find this vision your relaxation is complete for the time being...and if you are not able to, then you need a little more practice.
 (pause). A burning candle... A burning candle... A burning candle... An endless desert... An endless desert... An endless desert... An athletic stadium... An athletic stadium... An athletic stadium... A Basketball game... A Basketball game... A Basketball game... A Fitness centre... A Fitness centre... A Fitness centre... A Volleyball game... A Volleyball game... A Volleyball game... Birds flying across a sunset... Birds flying across a sunset... Birds flying across a sunset... Starts of night... Starts of night... Starts of night... (long pause).

Resolve

Now is the time to repeat your resolve... repeat the same resolve that you made at the beginning of the practice, do not change it... repeat the resolve three times with full awareness and feeling. (pause). I will be successful in my life, I will be successful in my life. I will be successful in my life.

Finish

Relax all efforts, draw your breathing... Become aware of the natural breath. (pause) Awareness of the whole body and awareness of breathing. (pause) Your body is lying totally relaxed on the floor... you are breathing quietly and slowly. (pause) Develop awareness of your body from the top of the head to the tip of the toes and say mentally in your mind O-o-o-m-m-m. (pause) Repeat O-o-o-m-m-m mentally to yourself twice more. (pause) Become aware of the floor, and the position of your body lying on the floor.... Visualize the room around you, become aware of your surroundings. (pause) Lie quietly for some time and keep your eyes closed. (pause) Move your body and stretch yourself. Please take your own time, do not hurry. (pause) When you are sure that you are wide awake, sit up slowly and open your eyes. The practice of Yoga Nidra is now complete. The duration for the practice was 45 minutes.

Collection of Data

The data on selected variables were collected as a pre test before the commencement of the experimental training programme and as a post test after the completion of the training programme. The pre test physiological and psychological data were collected in the beginning of the competition season and post test physiological and psychological data were collected after a day's training programme during the competition season. The pre test and post test physiological and psychological data were collected separately on the previous day of the competition.

Administration of test

Physiological Variables

The subject was asked to lie down comfortably on a table with right arm extended and left arm flexed by placing the left hand on the chest. This position was instructed to maintain for collection of data for all physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature.

Pulse Rate

Pulse Rate was measured by palpation of radial artery at the thumb side of the wrist on the anterior surface of the forearm counted for one minute with the help of a stopwatch. The Pulse Rate was recorded in numbers.

Respiratory Rate

Respiratory Rate was measured by counting the rise and fall of the chest counted for one minute. It was recorded along with Body Temperature in order to avoid error due to consciousness and control of breath by the subject. The Respiratory Rate was recorded in numbers.

Body Temperature

To measure Body Temperature, oral temperature was taken by using a thermometer and was recorded in 'Fahrenheit'. The subject was asked to lie down comfortably on a table with right arm extended and left arm flexed by placing the left hand on the chest. The thermometer was placed under the tongue for two minutes and the reading was taken.

Blood Pressure

After taking the Pulse Rate, Respiratory Rate and Body Temperature, the Blood Pressure was taken with sphygmomanometer. Subject was asked to lie down comfortably on a table with right arm extended and left arm flexed by placing the left hand on the chest. The cuff was firmly fixed just above the elbow of the right arm and tightens the cuff by pressing the Bulb. The diaphragm of stethoscope was placed above the anterior side of the elbow near to the artery for palpating the pulse. Then the pressure was slowly released by opening the valve by watching the needle of the meter. When the first sound was heard, which will be sharp and snapping, the reading in the meter was recorded as Systolic Blood Pressure and when the sound become dull and disappeared, the reading in the meter was recorded as Diastolic Blood Pressure.

Psychological Variables

Group administration method was used to collect the psychological data. Competition State Anxiety Inventory (CSAI-2) developed by Martens et.al. was used to collect the data on Cognitive Anxiety, Somatic Anxiety and Self Confidence. Inventory for Sports Aggression (ISA) developed by Jayan and Santosh was used to collect the data on Instrumental Aggression and Hostile Aggression.

The subjects were tested in two groups of 40 subjects each. Before the administration of test, comfortable seating was arranged and all possible external distractions were eliminated. Rapport was established and general ideas of the tests were given. The following were the sequence of the administration of the questionnaire.

1. Competition State Anxiety Inventory (CSAI-2)
2. Inventory for Sports Aggression (ISA).

Only after administration of the first questionnaire, the second questionnaire was given. The subjects were asked to fill up the personal details in the space given in the questionnaire, followed by an understanding of the instruction printed on the top of the questionnaire. After the oral instruction, the subjects were asked to go through the items and indicate their choice according to the instruction given in the questionnaire. At every stage, doubts were cleared and clarifications were given to the subjects wherever necessary. In between two questionnaires an interval of 5 minutes was given. The subjects took an average of 40 minutes to complete the two questionnaires.

Method of scoring

Competition State Anxiety Inventory (CSAI-2)

Martens, Burton, Vealey, Smith and Bump developed a new version of the Competition State Anxiety Inventory (CSAI-2) in order to differentiate between the Cognitive Anxiety and Somatic components of state anxiety. A third factor, Self Confidence was emerged during the factor analysis. Thus negatively loaded items became Cognitive Anxiety and Somatic Anxiety sub scales and positively loaded items became the Self Confidence sub scale.

The CSAI-2 was scored by computing a separate total for each of the 3 sub scales with scores ranging from a low of 9 to a high of 36. The higher the score, the greater the cognitive or Somatic Anxiety state or the greater the state of Self Confidence. No total score for the inventory was computed.

The Cognitive Anxiety sub scale was calculated by totaling the score of the responses of item numbers 1, 4, 7, 10, 13, 16, 19, 22 and 25 in the questionnaire. The

scores 1, 2, 3 and 4 were given for the responses of 'Not at all', 'Some what', 'Moderately so' and 'Very much so' respectively.

The Somatic Anxiety sub scale was calculated by totaling the score of the responses of item numbers 2, 5, 8, 11, 14, 17, 20, 23 and 26 in the questionnaire. The scores 1, 2, 3 and 4 were given for the responses of 'Not at all', 'Somewhat', 'Moderately so' and 'Very much so' respectively except for the item number 14 in which the scoring was in reverse order. Responses of 'Not at all', 'Somewhat', 'Moderately so' and 'Very much so' were given the scores 4, 3, 2 and 1 respectively for the item Number 14.

The Self Confidence sub scale was calculated by totaling the score of the responses of item numbers 3, 6, 9, 12, 18, 21, 24 and 9 in the questionnaire. The scores 1, 2, 3 and 4 were given for the responses of 'Not at all', 'Somewhat', 'Moderately so' and 'Very much so' respectively.

Inventories that were missing in not more than one response per subscale were treated as valid and scored, but inventory in which 2 or more items were missing from any one sub scale were treated as invalid and not scored. To obtain the sub scale scores when an item was omitted, the mean item score for the eight answered items was multiplied by the value 9 and then the product was rounded to the nearest whole number.

Inventory for Sports Aggression (ISA)

Jayan and Santosh developed an Inventory of sports aggression (ISA) in order to find out the Aggression in sports person and also to differentiate the Instrumental Aggression and Hostile Aggression. The questionnaire contains 16 items.

The ISA was scored by computing a separate total for each of the 2 sub scales with scores ranging from a low of 8 to a high of 40. The higher the score, the greater the Instrumental Aggression and Hostile Aggression. No total score for the inventory was computed.

The Instrumental Aggression sub scale was calculated by totaling the score of the responses of item numbers 2, 3, 4, 6, 7, 8, 9, and 10 in the questionnaire. The scores 5, 4, 3, 2 and 1 were given for the responses of 'Strongly agree', 'Agree', 'No opinion', 'Disagree' and 'Strongly Disagree' respectively.

The Hostile Aggression sub scale was calculated by totaling the score of the responses of item numbers 1, 5, 11, 12, 13, 14, 15, and 16 in the questionnaire. The scores 5, 4, 3, 2 and 1 were given for the responses of 'Strongly agree', 'Agree', 'No opinion', 'Disagree' and 'Strongly Disagree' respectively.

Statistical Techniques

The pre test and post test data of the selected variables were analyzed using t-test and analysis of covariance (ANCOVA). The t-test was applied to find out the significant difference between the pre test and post test means of the selected variables of the three experimental and control groups.

To compare the significance of difference among the three experimental groups and the control group the analysis of covariance was applied. The LSD post hoc test was applied wherever the F-ratio was found to be significant in order to find out whether there existed any significant differences among the paired adjusted post means. The level of significance chosen was 0.05.

Biju Lona K. “Effect of Cyclic Meditation and Yoga Nidra on Selected Physiological and Psychological Variables in College Level Athletes”., Thesis. Department of Physical Education, University of Calicut, 2008.

Chapter IV

ANALYSIS OF DATA AND RESULTS OF THE STUDY

Analysis of Data

The analysis of data pertaining to the effect of Cyclic Meditation, Yoga Nidra and Combined Meditation on physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, and Body Temperature and on psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression are presented in this chapter.

The pre and post test means of the selected physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, and Body Temperature and the psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression were analysed for mean difference using the t-test. To compare the mean differences on the selected physiological and psychological variable among the four groups, the analysis of covariance was employed. The LSD post hoc test was used, wherever the F-ratio was found to be significant. The level of confidence chosen was 0.05.

The results pertaining to the t-test and analysis of covariance for Pulse Rate are presented in table 4.

Table-4**T-TABLE ON PULSE RATE OF PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	79.60	66.75	12.85	0.78	16.43*
Yoga Nidra	79.50	64.40	13.10	0.80	16.35*
Combined Meditation	79.10	64.60	14.50	0.61	23.64*
Control	78.90	78.40	00.50	0.29	01.75

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 4 to find out the significant difference between pre and post test means on Pulse Rate indicates t-values of 16.43, 16.35 and 23.64 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, which are significant as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.75, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

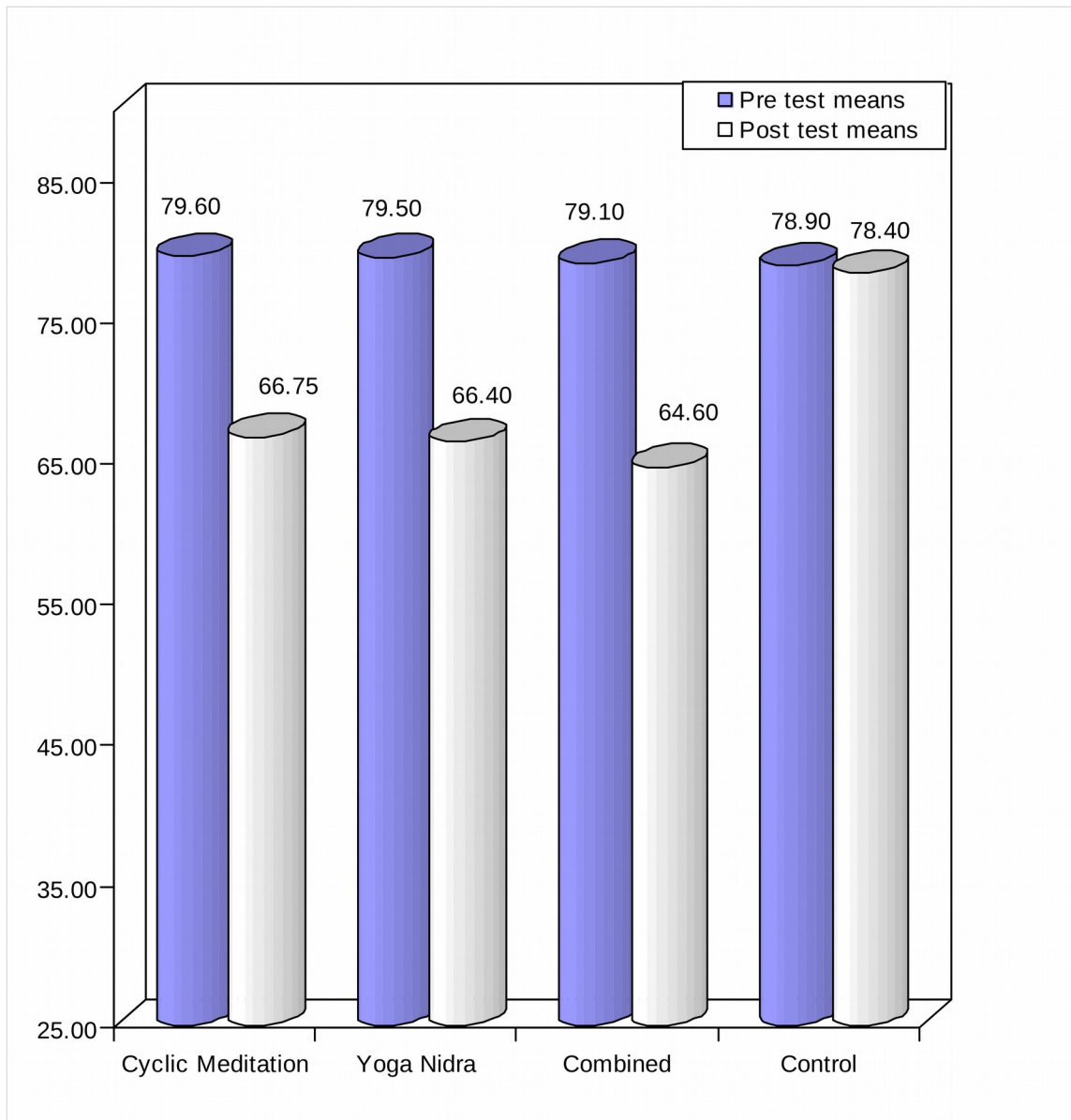


Fig.1. Pre and Post Test Means on Pulse Rate of the Experimental and Control groups

Table-5**ANALYSIS OF COVARIANCE DONE ON PULSE RATE AMONG THE DIFFERENT EXPERIMENTAL AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{yx}	MSS _{yx}	F-value
Treatment group means	3	6.55	2390.74	-81.42	2352.75	784.25	133.09*
Error	75	195.40	442.15	-6.40	441.94	5.89	
Total	78	201.95	2832.89	-87.83	2794.69		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 5 of analysis of covariance done on Pulse Rate indicates a significant F ratio, as the calculated F value of 133.09 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Hence, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 6.

Table-6

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL MEANS
DONE ON PULSE RATE AMONG EXPERIMENTAL
AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
66.76	66.41			0.35	1.35
66.76		64.59		2.17*	1.35
66.76			78.39	11.63*	1.35
	66.41	64.59		1.82*	1.35
	66.41		78.39	11.98*	1.35
		64.59	78.39	13.8*	1.35

*Significant at 0.05 level

Table 6 of LSD Post hoc test on Pulse Rate for differences in paired final means among the different Experimental and Control groups indicate significant values of 2.17 between Cyclic Meditation and Combined Meditation group, 11.63 between Cyclic Meditation and Control group, 1.82 between Yoga Nidra and Combined Meditation group, 11.98 between the Yoga Nidra and Control group, and 13.8 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. This does mean that Combined Meditation programme is a better one than Cyclic Meditation and Yoga Nidra, so as to reduce Pulse Rate in competing athletes. On the other hand, no significant difference has been found between Cyclic Meditation and Yoga Nidra group as the mean difference was only 0.35, which was much lower than 1.35, the C.D required to be significant at 0.05 level of confidence.

The final means of the Experimental and Control groups on Pulse Rate are shown in Figure 2.

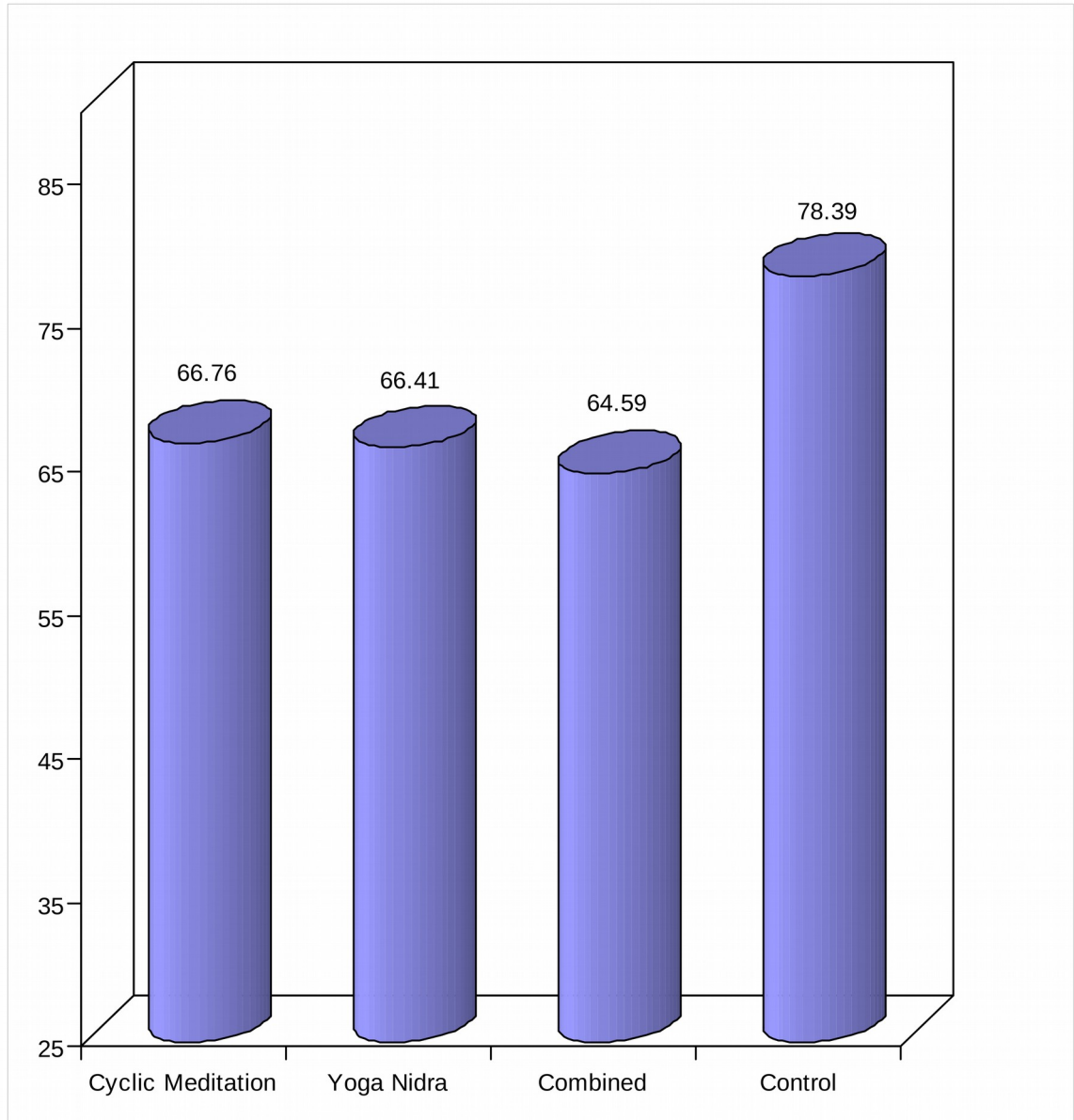


Fig.2. Final Means on Pulse Rate of the Experimental and Control groups

Table-7**T-TABLE ON RESPIRATORY RATE OF PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	20.15	17.05	3.1	0.33	9.35*
Yoga Nidra	19.85	17.10	2.75	0.27	10.18*
Combined Meditation	20.45	15.65	4.8	0.38	12.59*
Control	20.0	19.7	0.3	0.26	1.14

*Significant at 0.05 level $t_{0.05} (19) = 2.09$

Table 7 to find out the significant difference between pre and post test means on Respiratory Rate indicates significant t-values of 9.35, 10.18, and 12.59 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.14, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

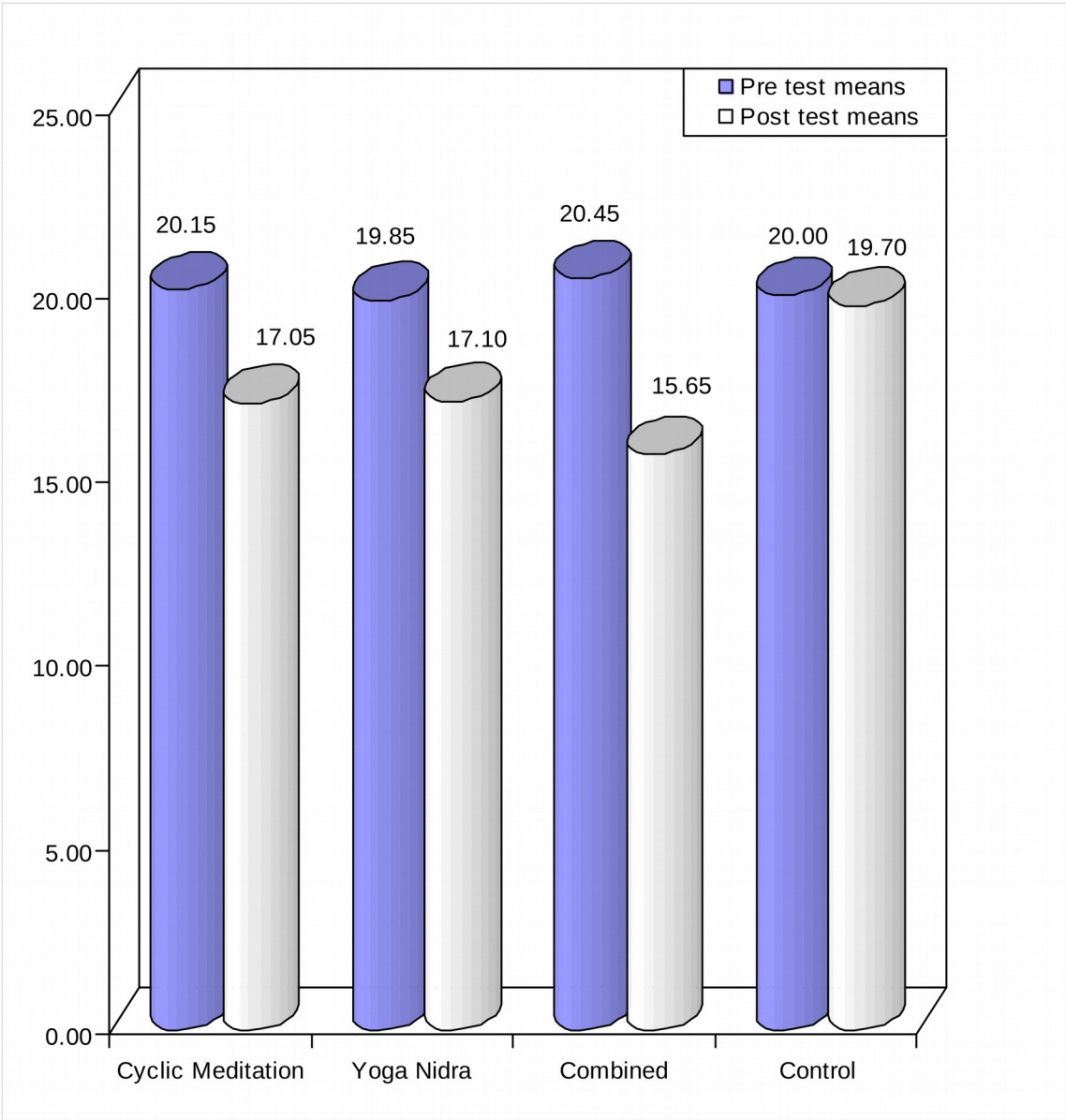


Fig.3. Pre and Post Test Means on Respiratory Rate of the Experimental and Control groups

Table-8

**ANALYSIS OF COVARIANCE DONE ON RESPIRATORY RATE
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS_x	SS_y	SS_{xy}	SS_{y.x}	MSS_{y.x}	F-value
Treatment group means	3	3.94	171.25	-15.67	179.58	59.86	51.18*
Error	75	136.05	101.50	43.30	87.72	1.17	
Total	78	139.99	272.75	27.63	267.30		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 8 of analysis of covariance done on Respiratory Rate indicates a significant F-ratio, as the calculated F-value of 51.18 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Subsequently, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 9.

Table-9

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL MEANS
DONE ON RESPIRATORY RATE AMONG EXPERIMENTAL
AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
17.04	17.18			0.14	1.35
17.04		15.54		1.5*	1.35
17.04			19.74	2.7*	1.35
	17.18	15.54		1.64*	1.35
	17.18		19.74	2.56*	1.35
		15.54	19.74	4.2*	1.35

*Significant at 0.05 level

Table 9 of LSD Post hoc test on Respiratory Rate for differences in paired final means among the different Experimental and Control groups indicate significant values of 1.5 between Cyclic Meditation and Combined Meditation group, 2.7 between Cyclic Meditation and Control group, 1.64 between Yoga Nidra and Combined Meditation group, 2.56 between the Yoga Nidra and Control group and 4.2 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. The findings indicate that the Combined Meditation training programme is a more effective one than Cyclic Meditation and Yoga Nidra for reduction of Respiratory Rate among athletes. On the other hand, no significant difference has been found between Cyclic Meditation and Yoga Nidra group as the mean difference was only 0.14, which was much less than 1.35, the C.D required to be significant at

0.05 level. The paired final means of the Experimental and Control groups on Respiratory Rate are shown in Figure 4.

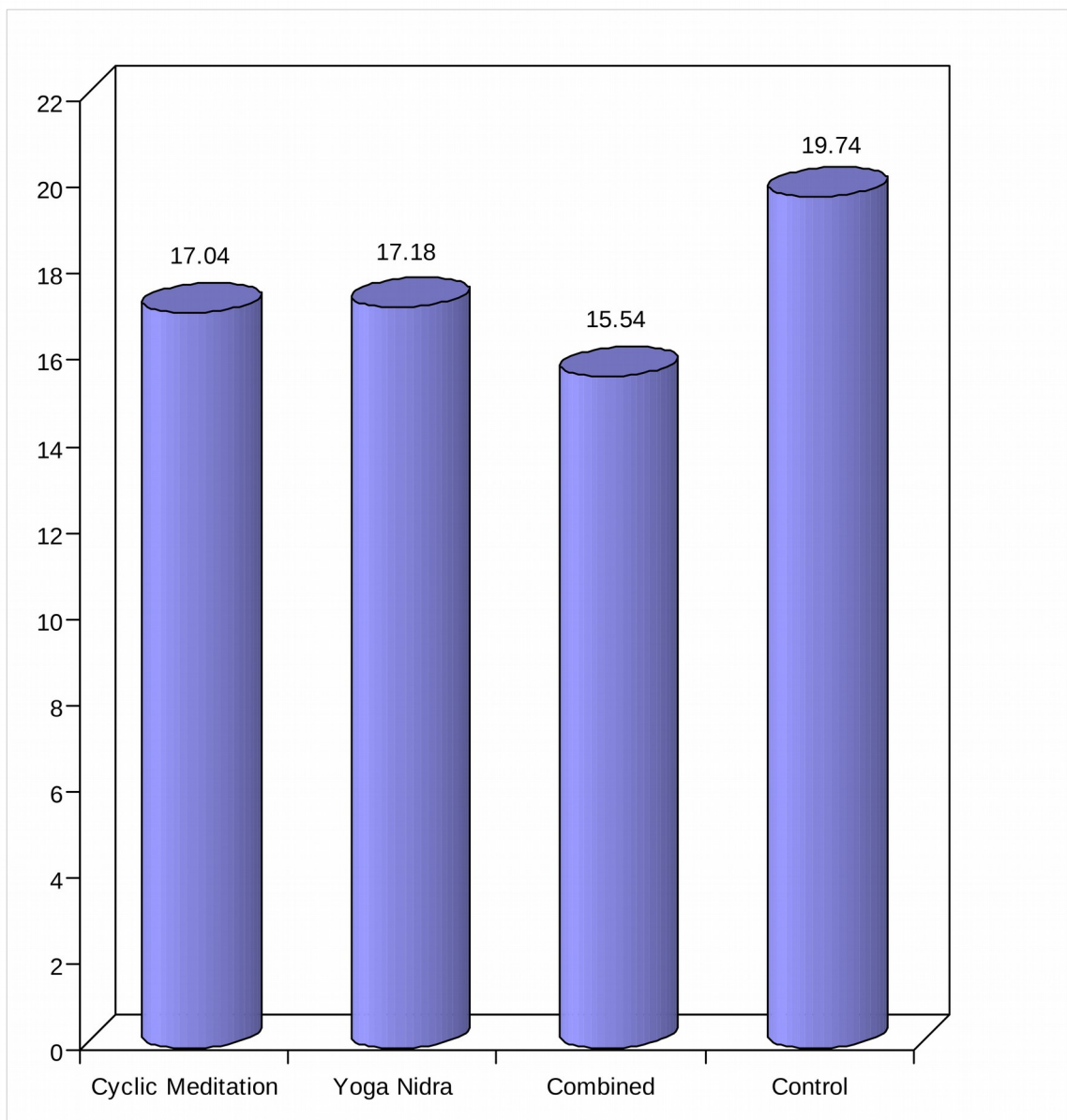


Fig.4. Final Means on Respiratory Rate of the Experimental and Control groups

Table-10

**T-TABLE ON SYSTOLIC BLOOD PRESSURE OF PRE AND
POST TEST MEANS OF THE EXPERIMENTAL
AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	132.20	118.40	14.80	0.88	16.91*
Yoga Nidra	133.80	118.80	15.00	0.90	16.66*
Combined Meditation	133.65	118.50	15.15	0.74	20.55*
Control	133.50	132.90	00.60	0.36	01.56

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 10 to find out the significant difference between pre and post test means on Systolic Blood Pressure indicates significant t-values of 16.91, 16.66, and 20.55 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.56, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

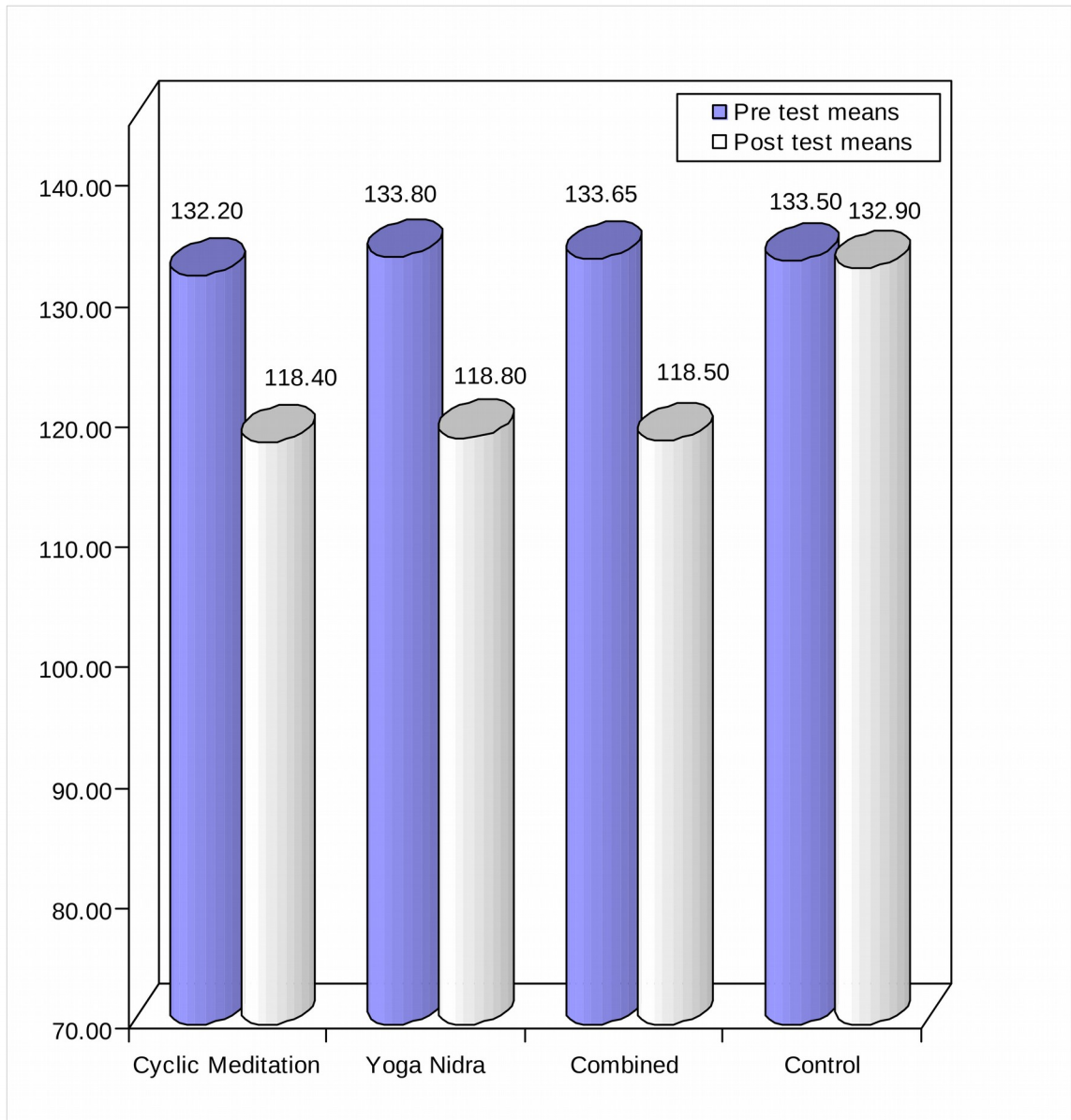


Fig.5. Pre and Post Test Means on Systolic Blood Pressure of the Experimental and the Control groups

Table-11

**ANALYSIS OF COVARIANCE DONE ON SYSTOLIC BLOOD PRESSURE
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	3.94	3083.40	-8.55	3088.81	1029.60	235.27*
Error	75	1091.95	426.80	328.10	328.22	4.38	
Total	78	1095.89	3510.20	319.55	3417.02		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 11 of analysis of covariance done on Systolic Blood Pressure indicates a significant F-ratio, as the calculated F-value of 235.27 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Hence, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on adjusted final means of the Post test data and the results are presented in Table 12.

Table-12

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL MEANS
DONE ON SYSTOLIC BLOOD PRESSURE AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
118.5	118.72			0.22	1.35
118.5		118.47		0.03	1.35
118.5			132.91	14.41*	1.35
	118.72	118.47		0.25	1.35
	118.72		132.91	14.19*	1.35
		118.47	132.91	14.44*	1.35

*Significant at 0.05 level

Table 12 of LSD Post hoc test on Systolic Blood Pressure for differences in paired final means among the different Experimental and Control groups indicates significant values of 14.41 between Cyclic Meditation and Control group, 14.19 between Yoga Nidra and Control group and 14.44 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean difference were 0.22, 0.03 and 0.25 respectively, which were much less than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation are equally effective to reduce the

Systolic Blood Pressure, as no significant mean differences were found among the different groups and hence any of the experimental programmes can be used to reduce the Systolic Blood Pressure. The final means of the Experimental and Control groups on Systolic Blood Pressure are shown in Figure 6.

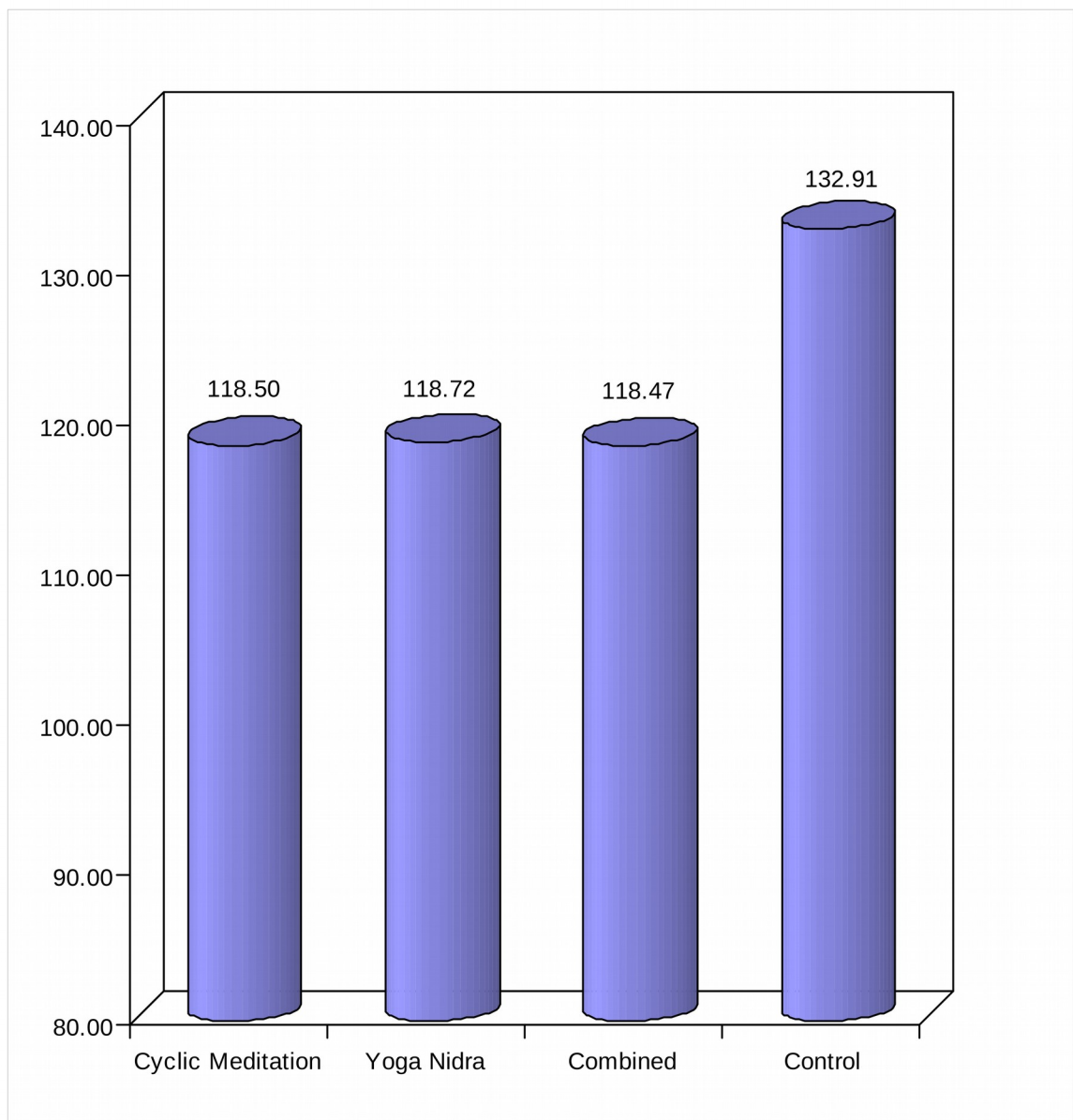


Fig.6. Final Means on Systolic Blood Pressure of the Experimental and Control groups

Table-13

**T-TABLE ON DIASTOLIC BLOOD PRESSURE FOR PRE TO
POST TEST MEANS OF THE EXPERIMENTAL
AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	97.20	76.50	20.70	0.74	27.83*
Yoga Nidra	97.50	77.00	20.50	0.90	22.66*
Combined Meditation	96.30	76.80	19.50	0.88	22.13*
Control	96.10	95.10	01.00	0.49	02.03

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 13 to find out the significant difference between pre and post test means on Diastolic Blood Pressure indicates significant t-values of 27.83, 22.66 and 22.13 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. On the other hand, the t-value obtained for the Control group was only 2.03, which is less than the tabulated value of 2.09 indicating that there exist no difference in Pre and Post means of the Control group.

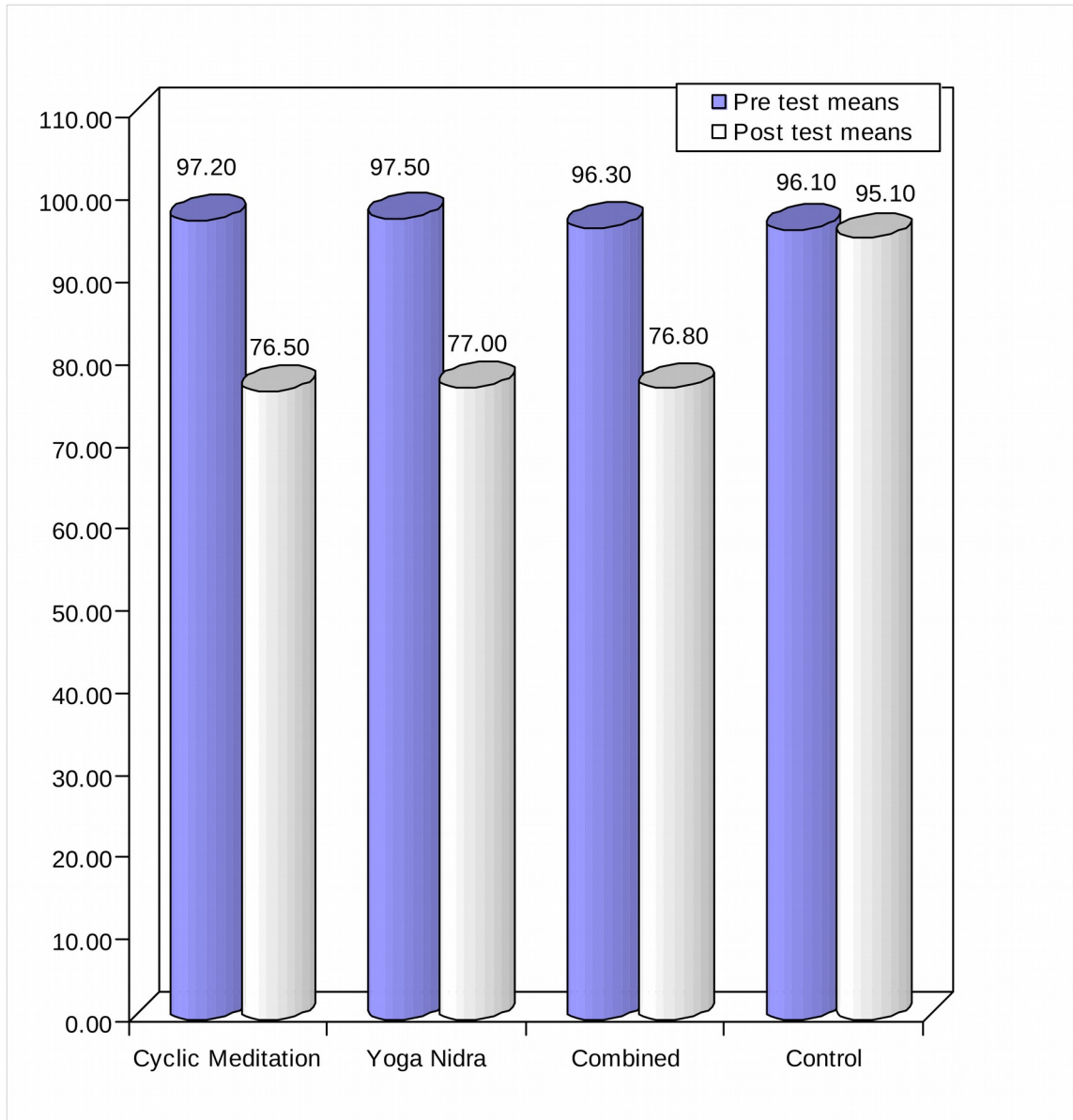


Fig.7. Pre and Post Test Means on Diastolic Blood Pressure of the Experimental and Control groups

Table-14

**ANALYSIS OF COVARIANCE DONE ON DIASTOLIC BLOOD
PRESSURE AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	27.75	5044.20	-246.70	5080.33	1693.44	343.35*
Error	75	872.20	410.00	187.00	369.91	4.93	
Total	78	899.95	5454.20	-59.70	5450.24		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 14 of analysis of covariance done on Diastolic Blood Pressure indicates a significant F-ratio, as the calculated F value of 343.35 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Hence, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 15.

Table-15

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL MEANS
DONE ON DIASTOLIC BLOOD PRESSURE AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
76.41	76.84			0.43	1.35
76.41		76.9		0.49	1.35
76.41			95.24	18.83*	1.35
	76.84	76.9		0.06	1.35
	76.84		95.24	18.40*	1.35
		76.9	95.24	18.34*	1.35

*Significant at 0.05 level

Table 15 of LSD Post hoc test on Diastolic Blood Pressure for differences in paired final means among the different Experimental and Control groups indicates significant values of 18.83 between Cyclic Meditation and Control group, 18.40 between Yoga Nidra and Control group and 18.34 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean difference were 0.43, 0.49 and 0.06 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups are equally effective to reduce Diastolic Blood Pressure, as no significant mean differences were found

among the different groups and hence any of the experimental programme can be used to reduce the Diastolic Blood Pressure. The final means of the Experimental and Control groups on Diastolic Blood Pressure are shown in Figure 8.

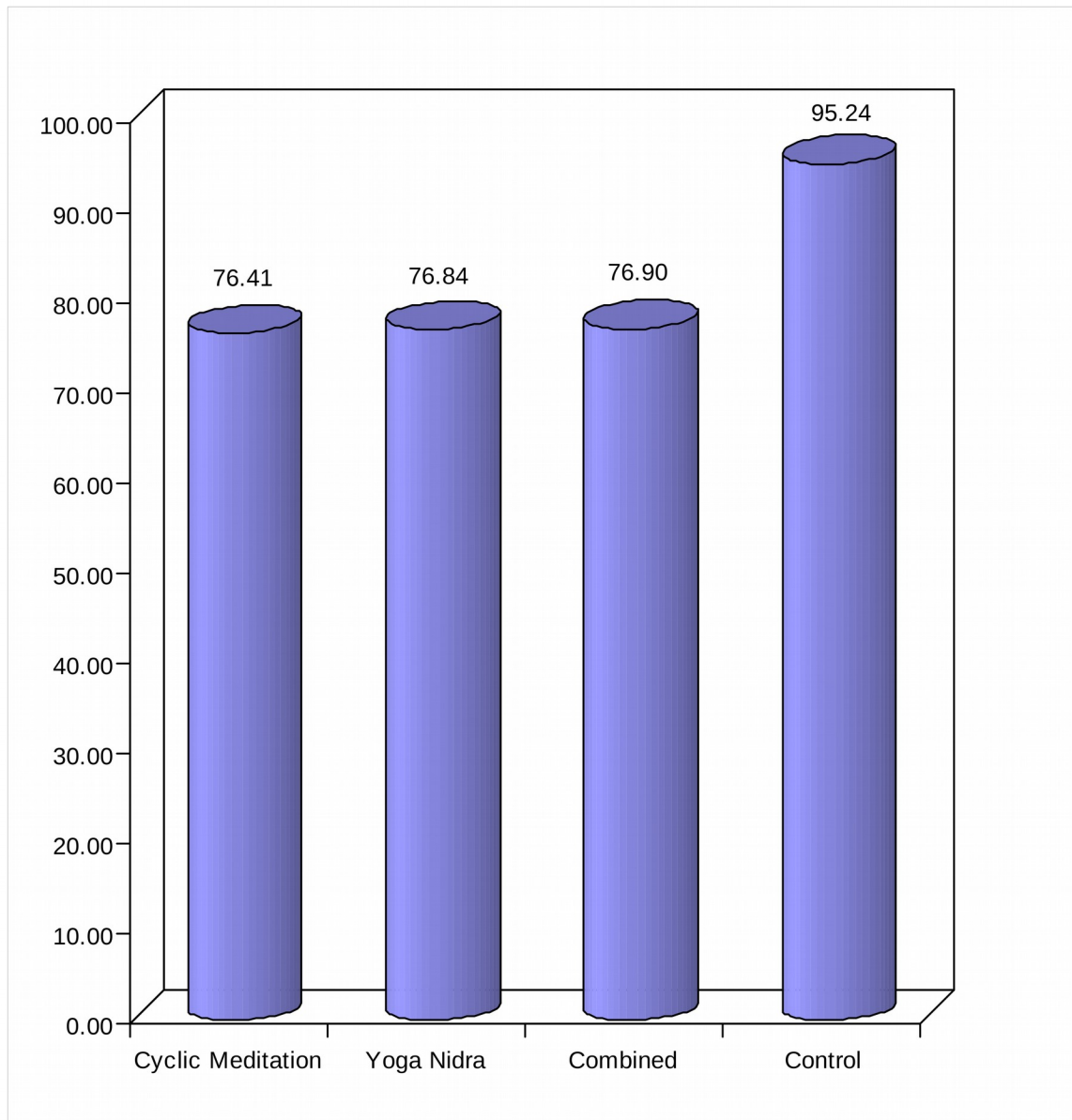


Fig.8. Final Means on Diastolic Blood Pressure of the Experimental and Control groups

Table-16**T-TABLE ON BODY TEMPERATURE FOR PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	101.30	97.8	3.50	0.47	7.40*
Yoga Nidra	100.00	97.85	2.15	0.31	6.93*
Combined Meditation	101.50	97.60	3.90	0.42	9.23*
Control	101.25	100.80	0.45	0.23	1.92

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 16 to find out the significant difference between pre and post test means on Body Temperature indicates significant t-values of 7.40, 6.93, and 9.23 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t- value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.92, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

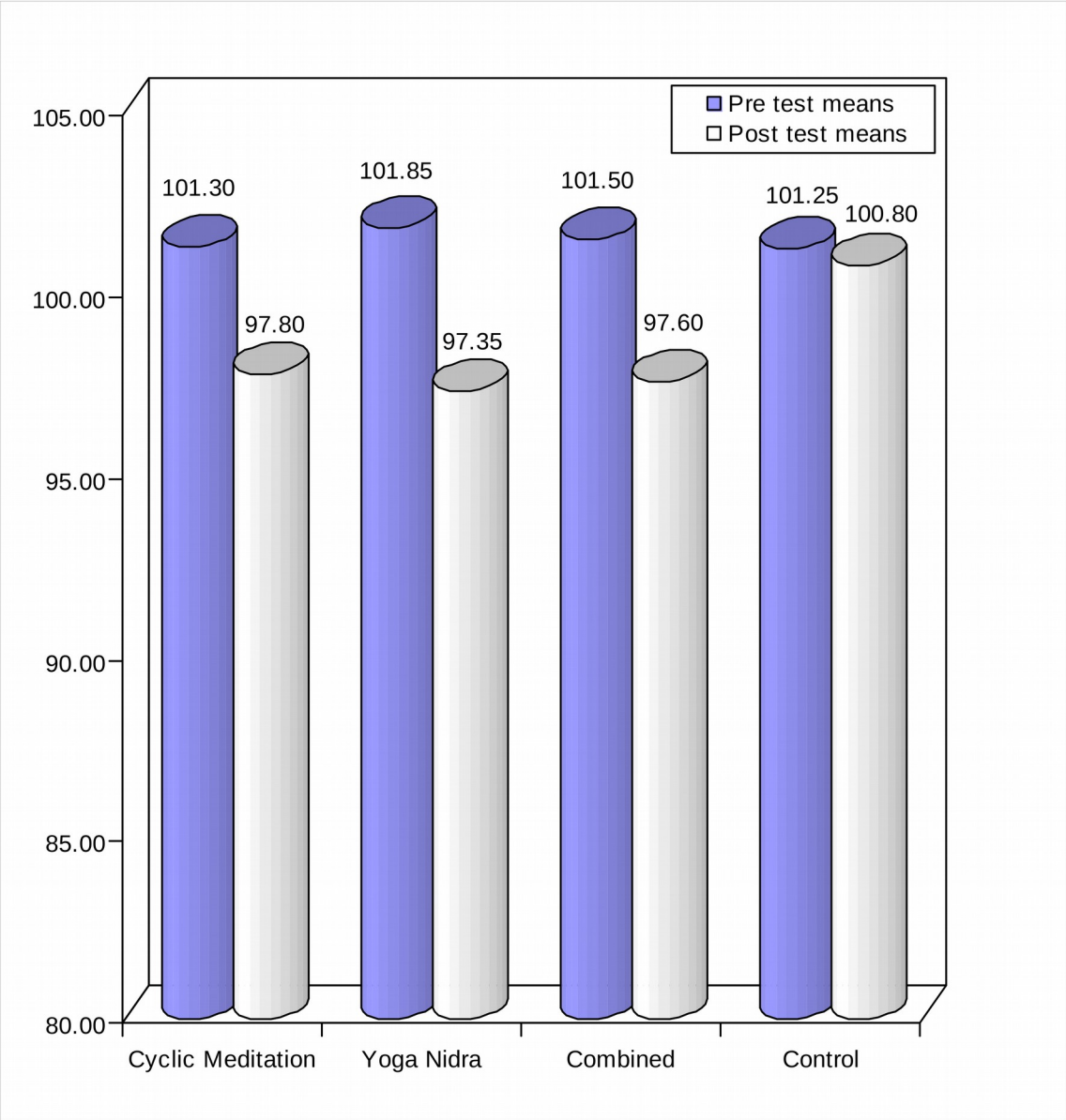


Fig.9. Pre and Post Test Means on Body Temperature of the Experimental and Control groups

Table-17

**ANALYSIS OF COVARIANCE DONE ON BODY TEMPERATURE
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	39.85	150.30	-1.05	156.37	52.12	34.90*
Error	75	358.90	165.50	138.55	112.01	1.49	
Total	78	398.75	315.80	137.50	268.39		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 17 of analysis of covariance done on Body Temperature indicates a significant F-ratio, as the calculated F value of 34.90 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Further, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on adjusted final means of the Post test data and the results are presented in Table 18.

Table-18

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL
MEANS DONE ON BODY TEMPERATURE AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
97.73	98.28			0.55	1.35
97.73		97.03		0.70	1.35
97.73			100.75	3.02*	1.35
	98.28	97.03		1.25	1.35
	98.28		100.75	2.47*	1.35
		97.03	100.75	3.72*	1.35

*Significant at 0.05 level

Table 18 of LSD Post hoc test on Body Temperature for differences in paired final means among the different Experimental and Control groups indicates significant values of 3.02 between Cyclic Meditation and Control group, 2.47 between Yoga Nidra and Control group and 3.72 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean difference were 0.55, 0.70 and 1.25 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups are equally effective to

reduce Body Temperature, as no significant mean differences were found among the different groups and hence any of the experimental programmes can be used to reduce Body Temperature. The final means of the Experimental and Control groups on Body Temperature are shown in Figure 10.

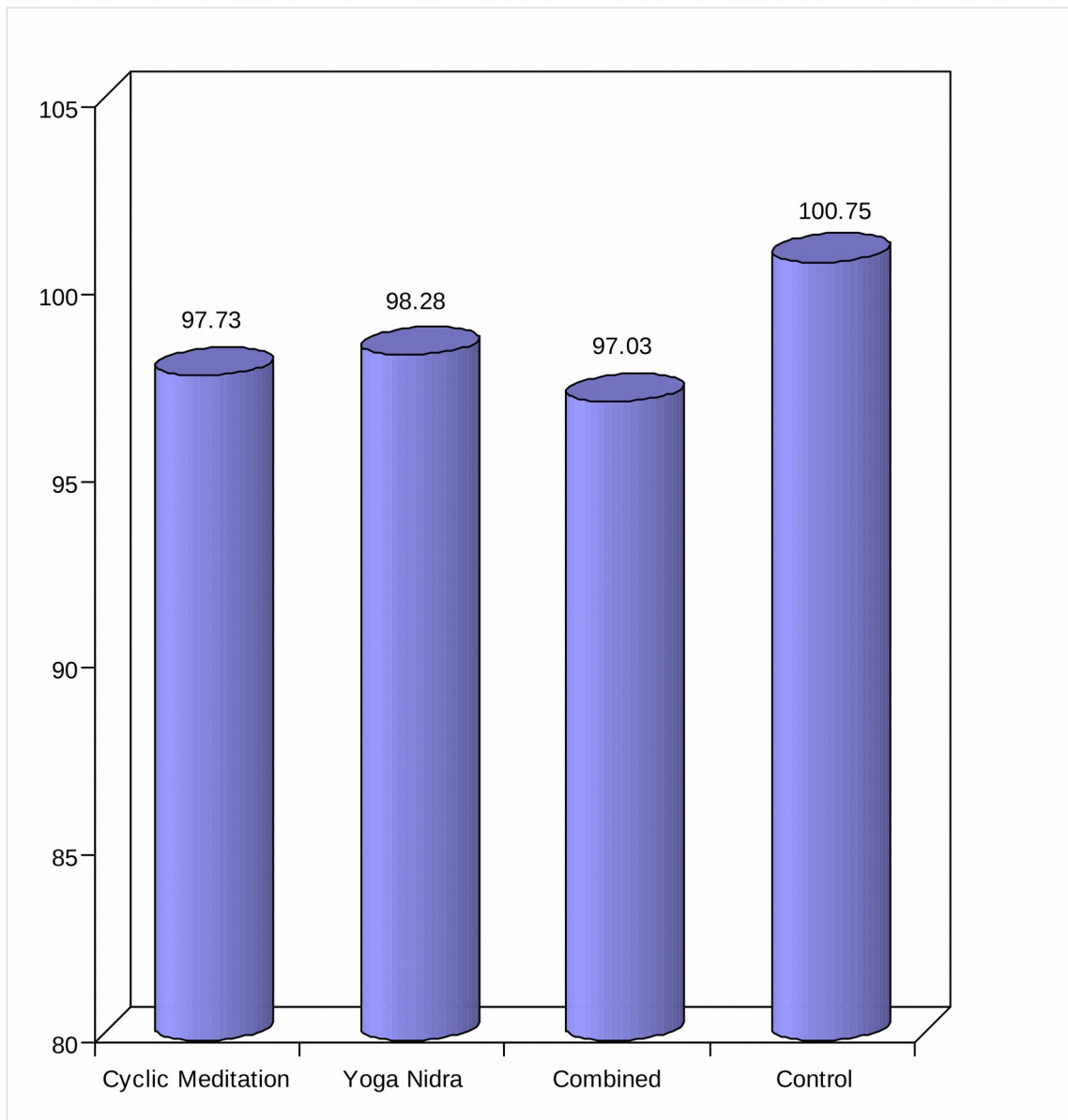


Fig.10. Final Means on Body Temperature of the Experimental and Control groups

Table-19**T-TABLE ON COGNITIVE ANXIETY OF PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	28.00	20.80	7.20	0.77	9.39*
Yoga Nidra	28.85	21.50	7.35	0.63	11.76*
Combined Meditation	28.40	20.25	8.15	0.66	12.39*
Control	29.60	29.30	0.30	0.26	1.14

*Significant at 0.05 level as $t_{0.05}(19) = 2.09$

Table 19 to find out the significant difference between pre and post test means on Cognitive Anxiety indicates significant t-values of 9.39, 11.76 and 12.39 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.14, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

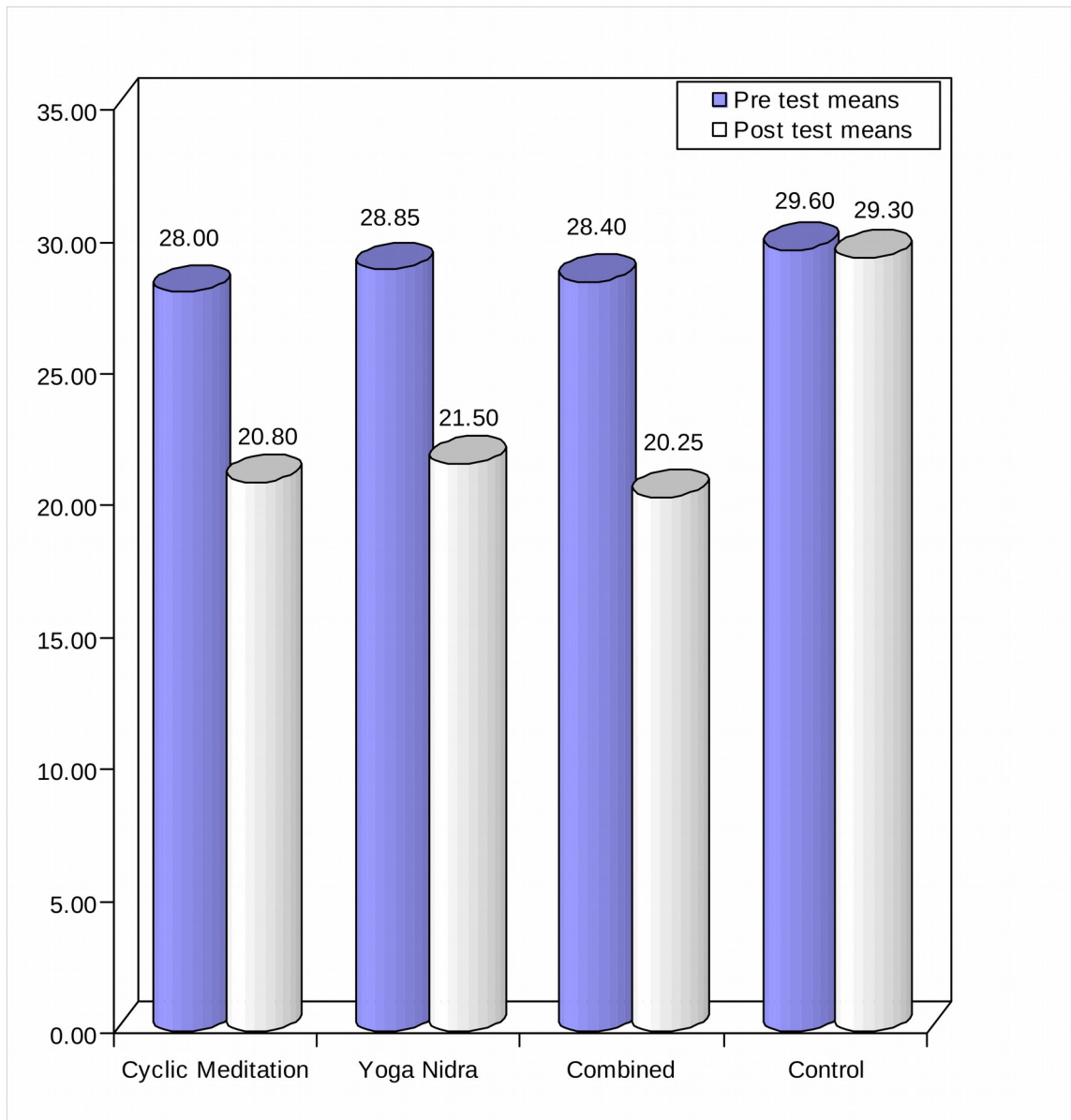


Fig.11. Pre and Post Test Means on Cognitive Anxiety of the Experimental and Control groups

Table-20

**ANALYSIS OF COVARIANCE DONE ON COGNITIVE ANXIETY
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS_x	SS_y	SS_{xy}	SS_{y.x}	MSS_{y.x}	F-value
Treatment group means	3	28.24	1086.74	156.24	971.86	323.95	80.45*
Error	75	416.15	320.15	86.90	302.00	4.03	
Total	78	444.39	1406.89	243.14	1273.86		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 20 of analysis of covariance done on Cognitive Anxiety indicates a significant F ratio, as the calculated F value of 80.45 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Subsequently, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 21.

Table-21

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL
MEANS DONE ON COGNITIVE ANXIETY AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
20.95	21.47			0.52	1.35
20.95		20.32		0.63	1.35
20.95			29.11	8.16*	1.35
	21.47	20.32		1.15	1.35
	21.47		29.11	7.64*	1.35
		20.32	29.11	8.79*	1.35

*Significant at 0.05 level

Table 21 of LSD Post hoc test on Cognitive Anxiety for differences in paired final means among the different Experimental and Control groups indicates significant values of 8.16 between Cyclic Meditation and Control group, 7.64 between Yoga Nidra and Control group and 8.79 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean differences were 0.52, 0.63 and 1.15 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups are equally effective to reduce Cognitive Anxiety, as no significant mean differences were found among the

different groups and hence any of the experimental programmes can be used to reduce Cognitive Anxiety. The final means of the Experimental and Control groups on Cognitive Anxiety are shown in Figure 12.

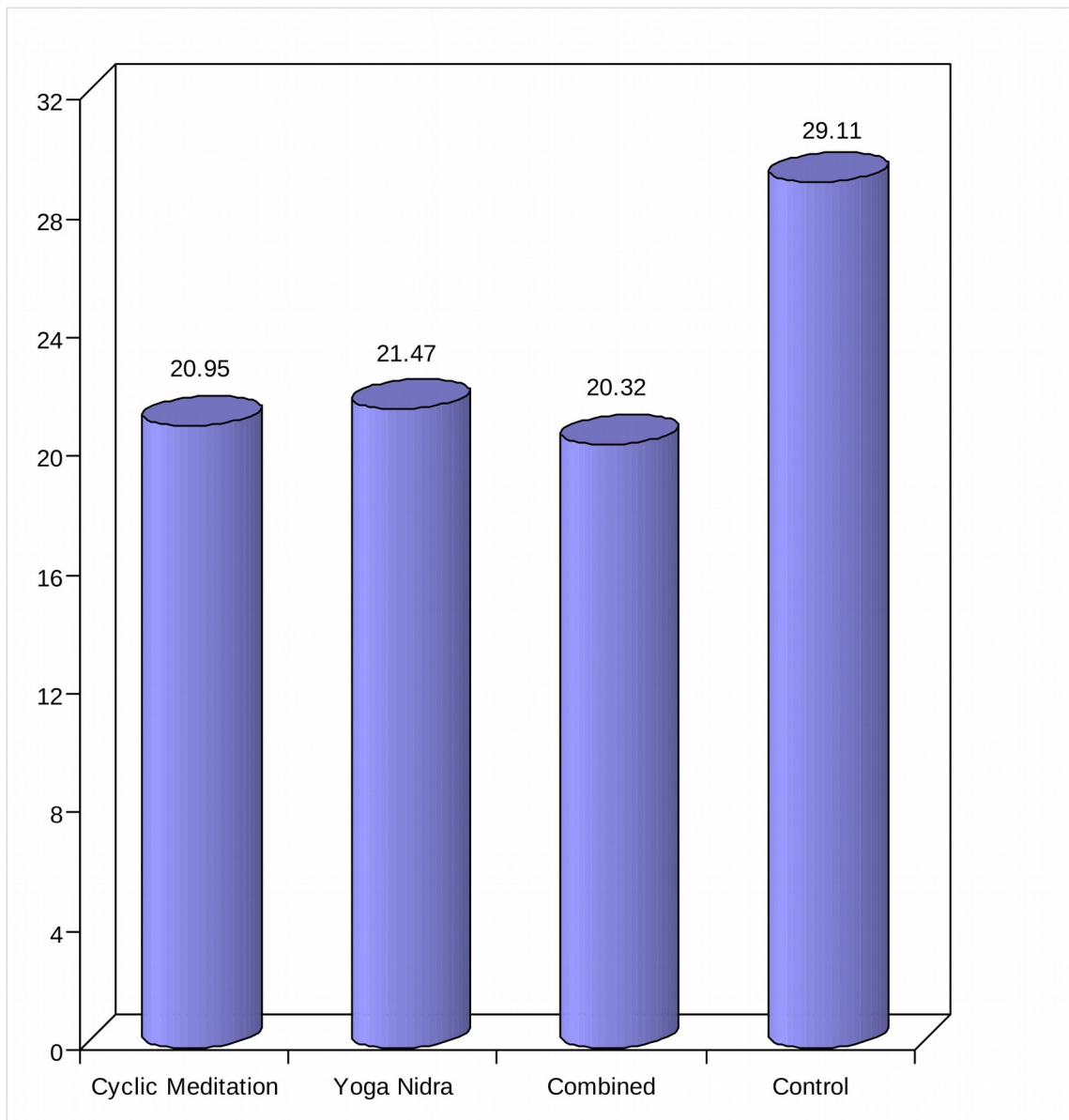


Fig.12. Final Means on Cognitive Anxiety of the Experimental and Control groups

Table-22**T-TABLE ON SOMATIC ANXIETY OF PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	29.40	21.10	8.30	0.55	15.14*
Yoga Nidra	30.15	21.10	9.05	0.65	13.99*
Combined Meditation	29.55	21.50	8.05	0.69	11.67*
Control	29.85	29.50	0.35	0.23	1.51

*Significant at 0.05 level as $t_{0.05}(19) = 2.09$

Table 22 to find out the significant difference between pre and post test means on Somatic Anxiety indicates significant t-values of 15.14, 13.99 and 11.67 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. On the other hand, the t-value obtained for the Control group was only 1.51, which is less than the tabulated value of 2.09, showing that there exist no difference in Pre and Post means of the Control group.

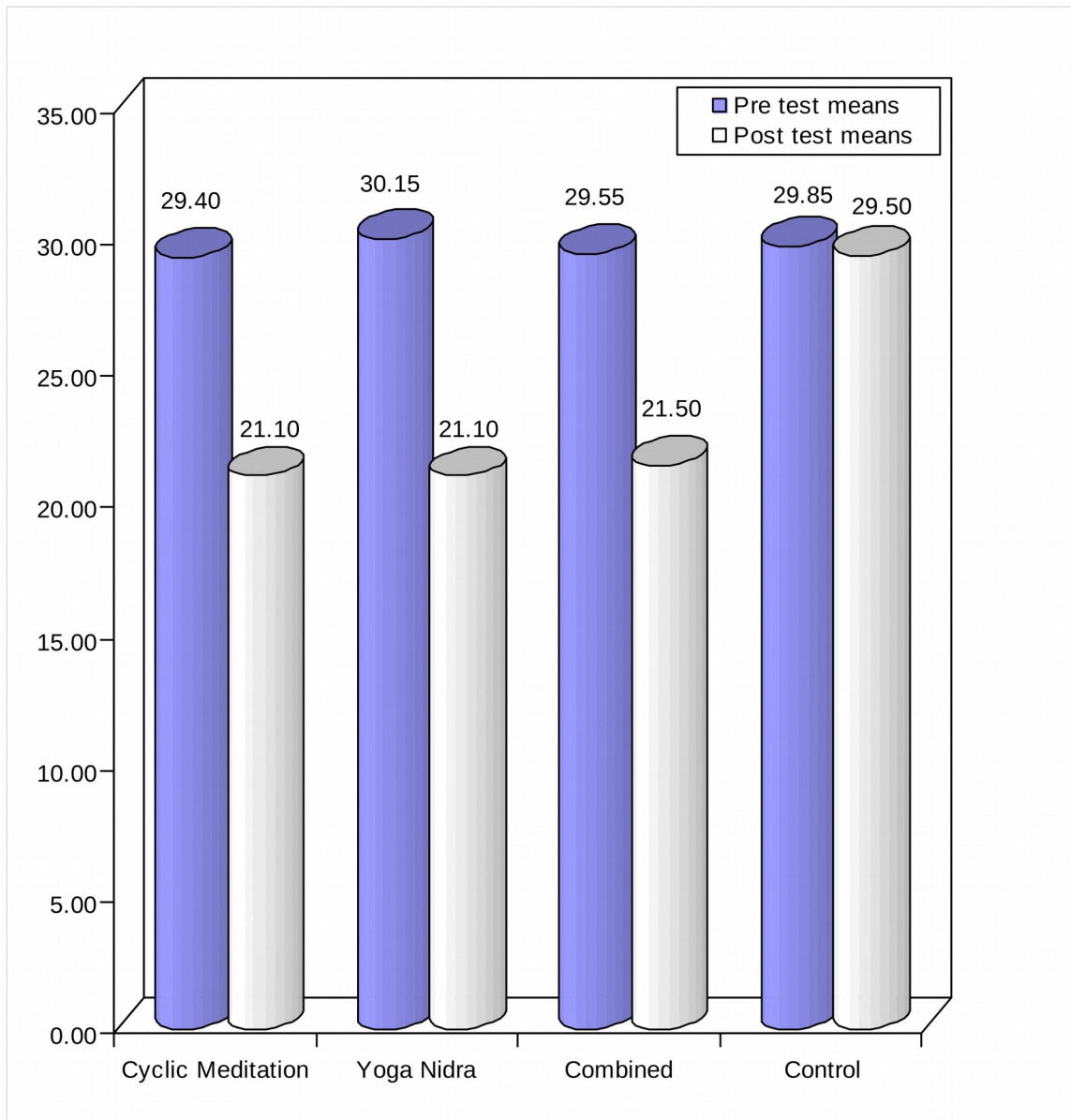


Fig.13. Pre and Post Test Means on Somatic Anxiety of the Experimental and Control groups

Table-23

**ANALYSIS OF COVARIANCE DONE ON SOMATIC ANXIETY
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS_x	SS_y	SS_{xy}	SS_{y.x}	MSS_{y.x}	F-value
Treatment group means	3	6.64	1027.20	17.40	1017.04	339.01	72.38*
Error	75	236.85	369.60	65.90	351.26	4.68	
Total	78	243.49	1396.80	83.30	1368.30		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 23 of analysis of covariance done on Somatic Anxiety indicates a significant F ratio, as the calculated F-value of 72.38 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Furthermore, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on adjusted final means of the Post test data and the results are presented in Table 24.

Table-24

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL
MEANS DONE ON SOMATIC ANXIETY AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
21.19	20.99			0.20	1.35
21.19		21.55		0.36	1.35
21.19			29.47	8.28*	1.35
	20.99	21.55		0.56	1.35
	20.99		29.47	8.48*	1.35
		21.55	29.47	7.92*	1.35

*Significant at 0.05 level

Table 24 of LSD Post hoc test on Somatic Anxiety for differences in paired final means among the different Experimental and Control groups indicates significant values of 8.28 between Cyclic Meditation and Control group, 8.48 between Yoga Nidra and Control group and 7.92 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean differences were 0.20, 0.36 and 0.56 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups are equally effective to reduce Somatic Anxiety, as no significant mean differences were found among the

different groups and hence any of the experimental programmes can be used to reduce Somatic Anxiety. The final means of the Experimental and Control groups on Somatic Anxiety are shown in Figure 14.

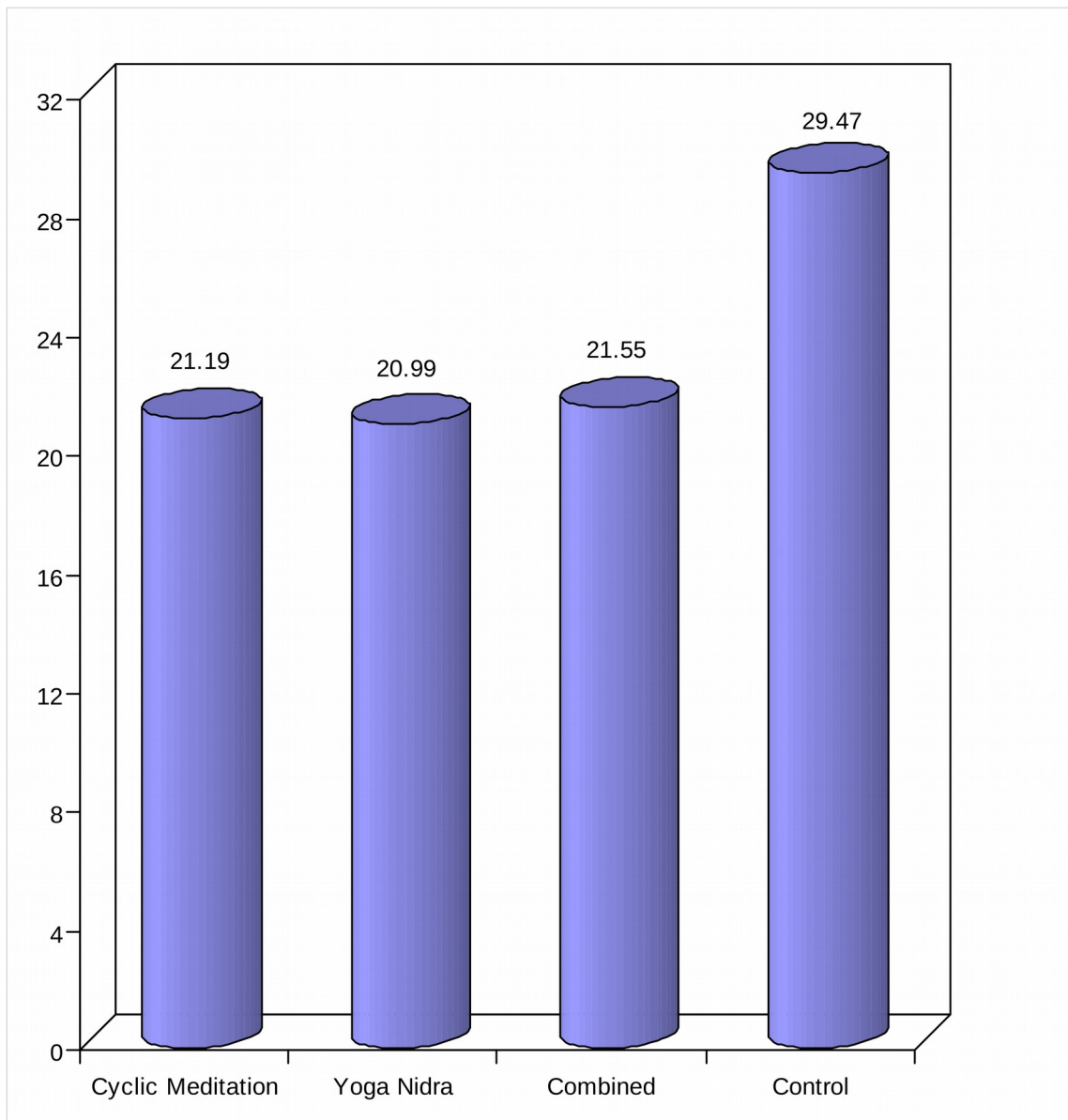


Fig.14. Final Means on Somatic Anxiety of the Experimental and Control groups

Table-25**T-TABLE ON SELF CONFIDENCE OF PRE AND POST TEST MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	27.65	29.55	1.90	0.19	9.97*
Yoga Nidra	27.45	30.00	2.55	0.36	7.10*
Combined Meditation	27.15	29.80	2.65	0.37	7.13*
Control	28.75	28.70	0.05	0.27	0.19

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 25 to find out the significant difference between pre and post test means on Self Confidence indicates significant t-values of 9.97, 7.10 and 7.13 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. On the other hand, the t-value obtained for the Control group was only 0.19, which is less than the tabulated value of 2.09, showing that there exist no difference in Pre and Post means of the Control group.

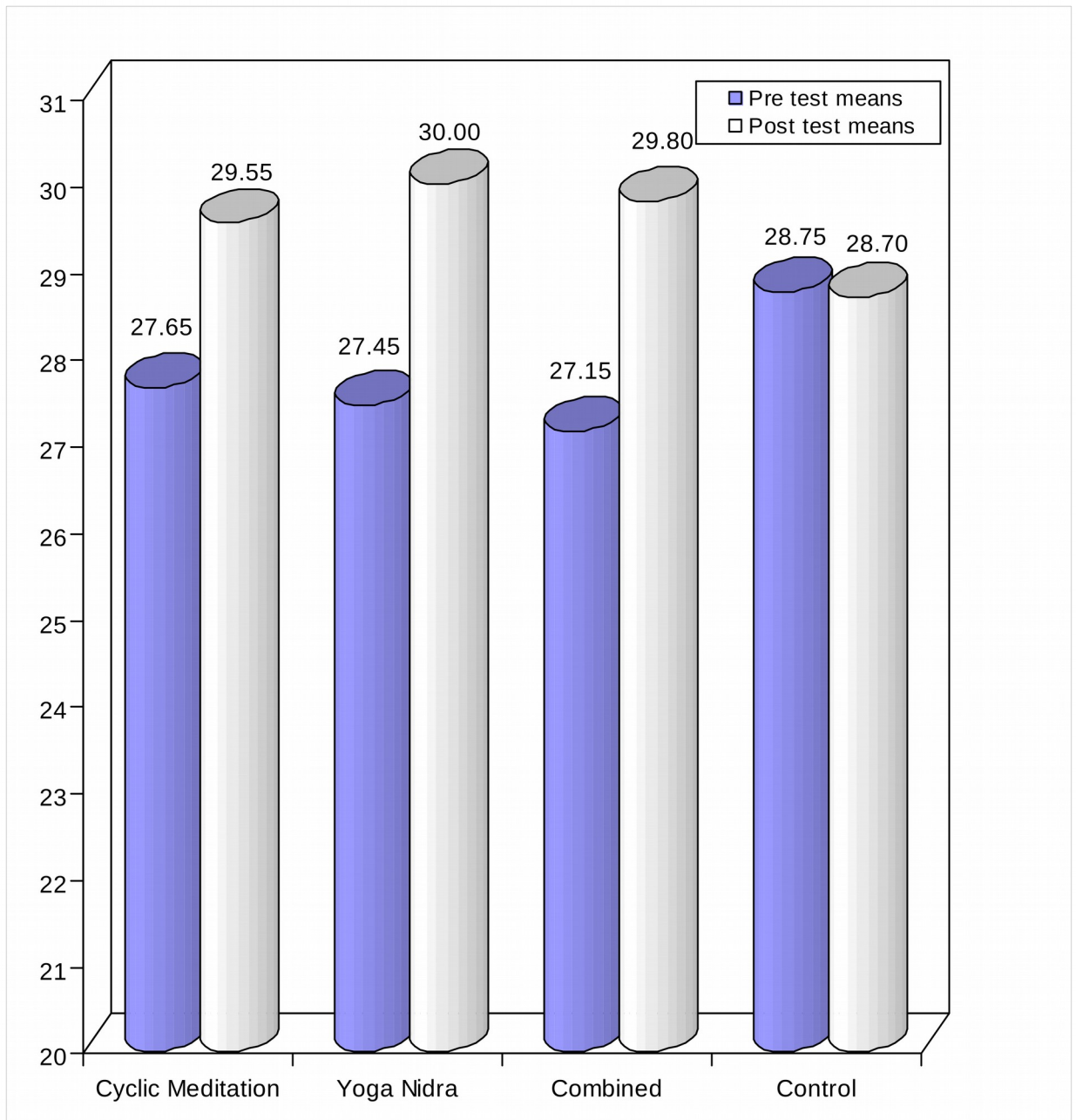


Fig.15. Pre and Post Test Means on Self Confidence of the Experimental and Control groups

Table-26

**ANALYSIS OF COVARIANCE DONE ON SELF CONFIDENCE
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	29.20	19.64	-22.70	55.41	18.47	13.19*
Error	75	289.80	224.35	185.95	105.04	1.40	
Total	78	319.00	243.99	163.25	160.44		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 26 of analysis of covariance done on Self Confidence indicates a significant F ratio, as the calculated F-value of 13.19 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Hence, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 27.

Table-27

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL
MEANS DONE ON SELF CONFIDENCE AMONG
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
29.61	30.19			0.58	1.35
29.61		30.18		0.57	1.35
29.61			28.06	1.55*	1.35
	30.19	30.18		0.01	1.35
	30.19		28.06	2.13*	1.35
		30.18	28.06	2.12*	1.35

*Significant at 0.05 level

Table 27 of LSD Post hoc test on Self Confidence for differences in paired final means among the different Experimental and Control groups indicates significant values of 1.55 between Cyclic Meditation and Control group, 2.13 between Yoga Nidra and Control group and 2.12 between Combined Meditation and Control group as those values were much higher than 1.35, the critical difference (C.D) needed to be significant at 0.05 level of confidence. On the other hand, no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group and Yoga Nidra and Combined Meditation group as the mean difference were 0.58, 0.57 and 0.01 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level. This does mean that all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups are equally effective to improve Self Confidence, as no significant mean differences were found among the

different groups and hence any of the experimental programmes can be used to improve Self Confidence. The final means of the Experimental and Control groups on Self Confidence are shown in Figure 16.

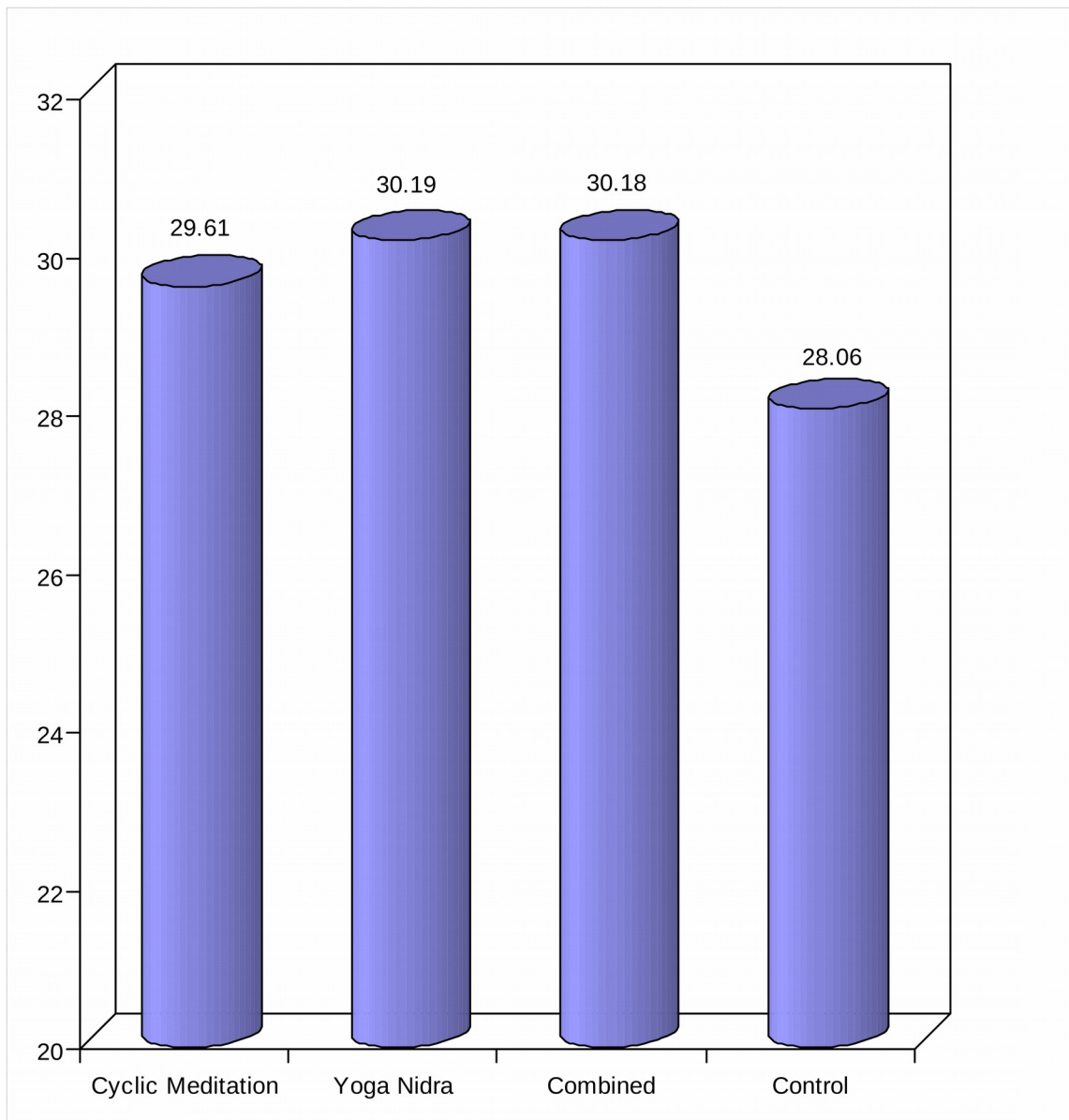


Fig.16. Final Means on Self Confidence of the Experimental and Control groups

Table-28

**T-TABLE ON INSTRUMENTAL AGGRESSION OF PRE AND
POST TEST MEANS OF THE EXPERIMENTAL
AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	28.80	29.75	0.95	0.31	3.05*
Yoga Nidra	28.75	29.80	1.05	0.44	2.36*
Combined Meditation	29.00	30.05	1.05	0.46	2.27*
Control	28.30	29.00	0.70	0.63	1.11

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 28 to find out the significant difference between pre and post test means on Instrumental Aggression indicates significant t-values of 3.05, 2.36 and 2.27 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.11, which is less than the tabulated value of 2.09, showing that there exist no difference in Pre and Post means of the Control group.

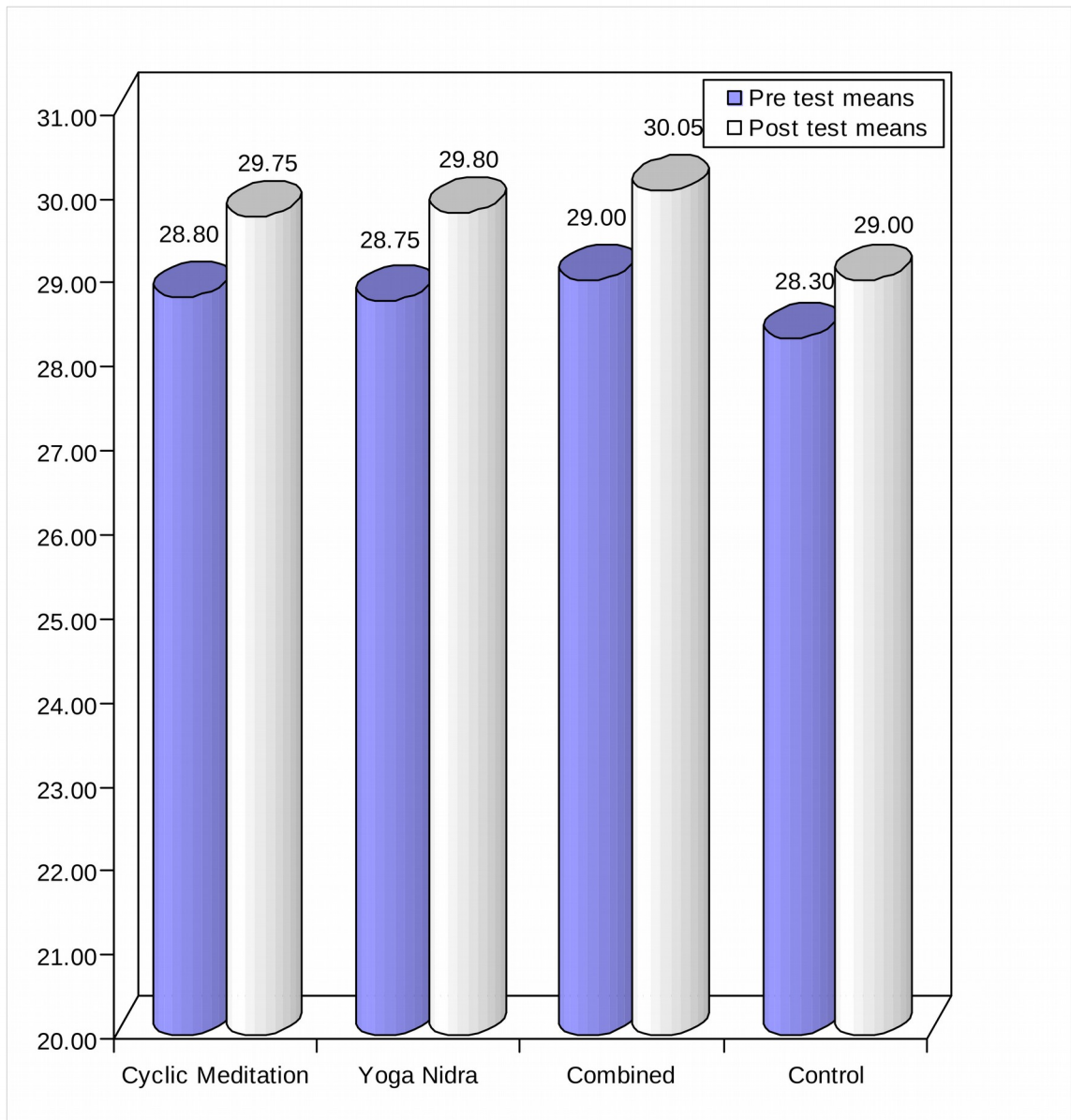


Fig.17. Pre and Post Test Means on Instrumental Aggression of the Experimental and Control groups

Table-29

**ANALYSIS OF COVARIANCE DONE ON INSTRUMENTAL AGGRESSION
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	5.24	12.30	7.95	3.12	1.04	0.24
Error	75	407.15	565.90	314.00	323.74	4.32	
Total	78	412.39	578.20	321.95	326.85		

$$F_{0.05}(3, 75) = 2.74$$

Table 29 of analysis of covariance done on Instrumental Aggression indicates that the calculated F-value of 0.24 is lesser than the tabulated F-value of 2.74, required for significance at 0.05 level. Since insignificant value has been found in the analysis of covariance, the significant t value seen in the pre and post t test was treated as due to sampling error. This does mean that all the treatments are not significantly effective in improving Instrumental Aggression, as there exist no significant differences among the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation group and Control group.

Table-30

**T-TABLE ON HOSTILE AGGRESSION OF PRE AND POST
TEST MEANS OF THE EXPERIMENTAL
AND CONTROL GROUPS**

Groups	Pre Means	Post Means	Dm	σDm	t-value
Cyclic Meditation	22.60	21.30	1.30	0.21	6.30*
Yoga Nidra	22.25	20.45	1.80	0.32	5.60*
Combined Meditation	21.20	19.90	1.30	0.21	6.30*
Control	23.45	23.20	0.25	0.18	1.42

*Significant at 0.05 level as $t_{0.05} (19) = 2.09$

Table 30 to find out the significant difference between pre and post test means on Aggression indicates significant t-values of 6.30, 5.60 and 6.30 for the Cyclic Meditation, Yoga Nidra and Combined Meditation groups respectively, as the obtained t-values were greater than the tabulated t-value of 2.09 required for significance at 0.05 level. However, the t-value obtained for the Control group was only 1.42, which is less than the tabulated value of 2.09 and hence there exist no difference in Pre and Post means of the Control group.

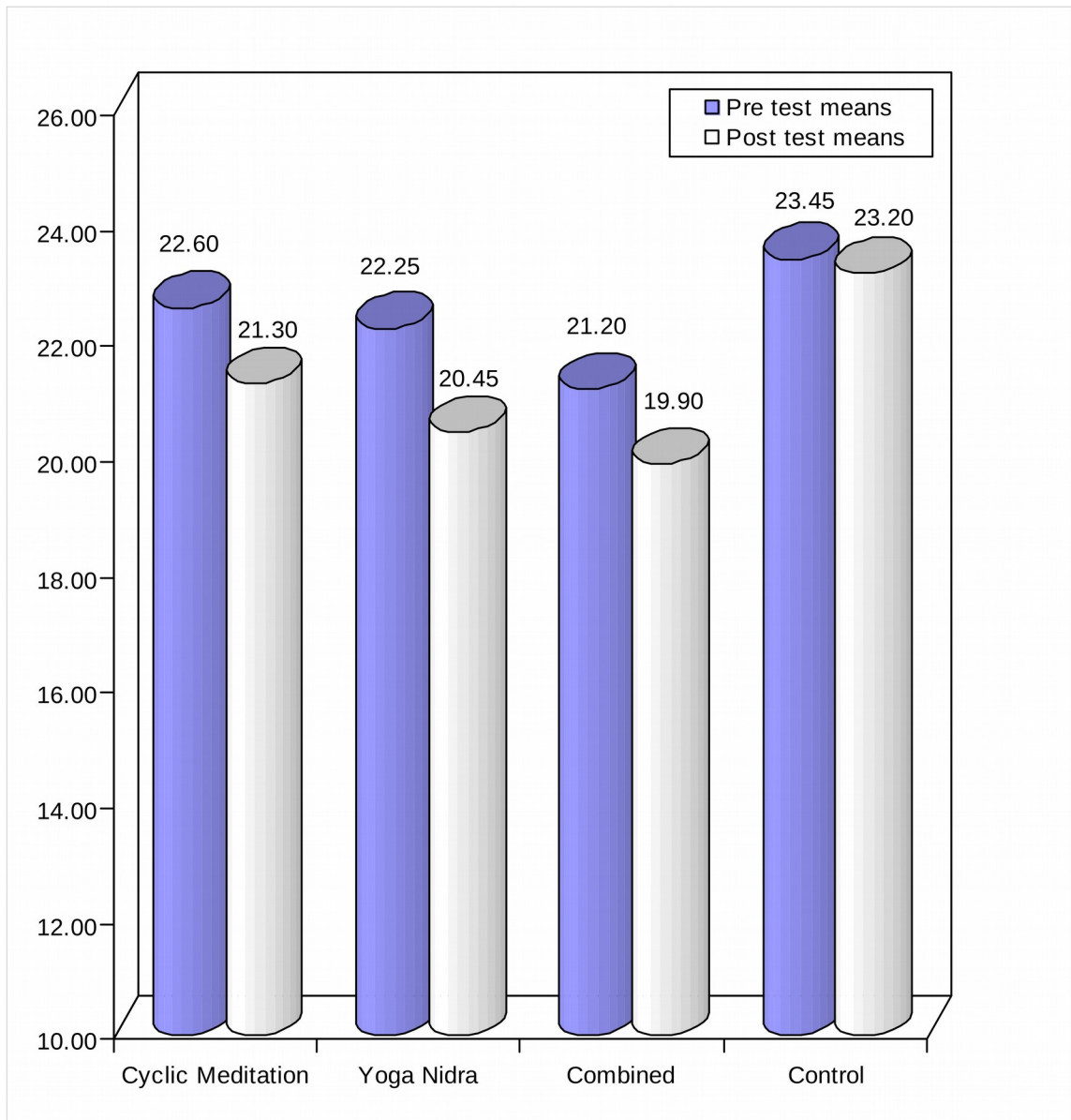


Fig.18. Pre and Post Test Means on Hostile Aggression of the Experimental and Control groups

Table-31

**ANALYSIS OF COVARIANCE DONE ON HOSTILE AGGRESSION
AMONG THE DIFFERENT EXPERIMENTAL
AND CONTROL GROUPS**

Source of variations	df	SS _x	SS _y	SS _{xy}	SS _{y.x}	MSS _{y.x}	F-value
Treatment group means	3	52.05	125.24	75.88	24.47	8.16	7.34*
Error	75	480.70	564.15	480.75	83.35	1.11	
Total	78	532.75	689.39	556.63	107.82		

*Significant at 0.05 level as $F_{0.05}(3, 75) = 2.74$

Table 31 of analysis of covariance done on Hostile Aggression indicates a significant F ratio, as the calculated F-value of 7.34 is greater than the tabulated F-value of 2.74, required for significance at 0.05 level. Hence, in order to find out the most effective training programme and also to explore whether any significant differences existed among the final means of Experimental and Control groups, the LSD post hoc test was applied for pair wise comparison analysis on final means of the Post test data and the results are presented in Table 32.

Table-32

**LSD POST HOC TEST FOR DIFFERENCES IN PAIRED FINAL MEANS
DONE ON HOSTILE AGGRESSION AMONG EXPERIMENTAL
AND CONTROL GROUPS**

Cyclic Meditation	Yoga Nidra	Combined Meditation	Control group	Mean Difference	CD at 5% level
21.07	20.58			0.49	1.35
21.07		21.08		0.01	1.35
21.07			22.12	1.05	1.35
	20.58	21.08		0.50	1.35
	20.58		22.12	1.54*	1.35
		21.08	22.12	1.04	1.35

*Significant at 0.05 level

Table 32 of LSD Post hoc test on Hostile Aggression for differences in paired final means among the different Experimental and Control groups indicates significant value of 1.54 between Yoga Nidra and Control group as this value was much higher than 1.35, the critical difference (C.D) at 0.05 level of confidence. On the other hand no significant differences have been found between Cyclic Meditation and Yoga Nidra group, between Cyclic Meditation and Combined Meditation group, between Cyclic Meditation and Control group, between Yoga Nidra and Combined Meditation group and between Combined Meditation and Control group as the mean differences were 0.49, 0.01, 1.05, 0.50 and 1.04 respectively, which were much lower than 1.35, the C.D required to be significant at 0.05 level of confidence. The final means of the Experimental and Control groups on Hostile Aggression are shown in Figure 19.

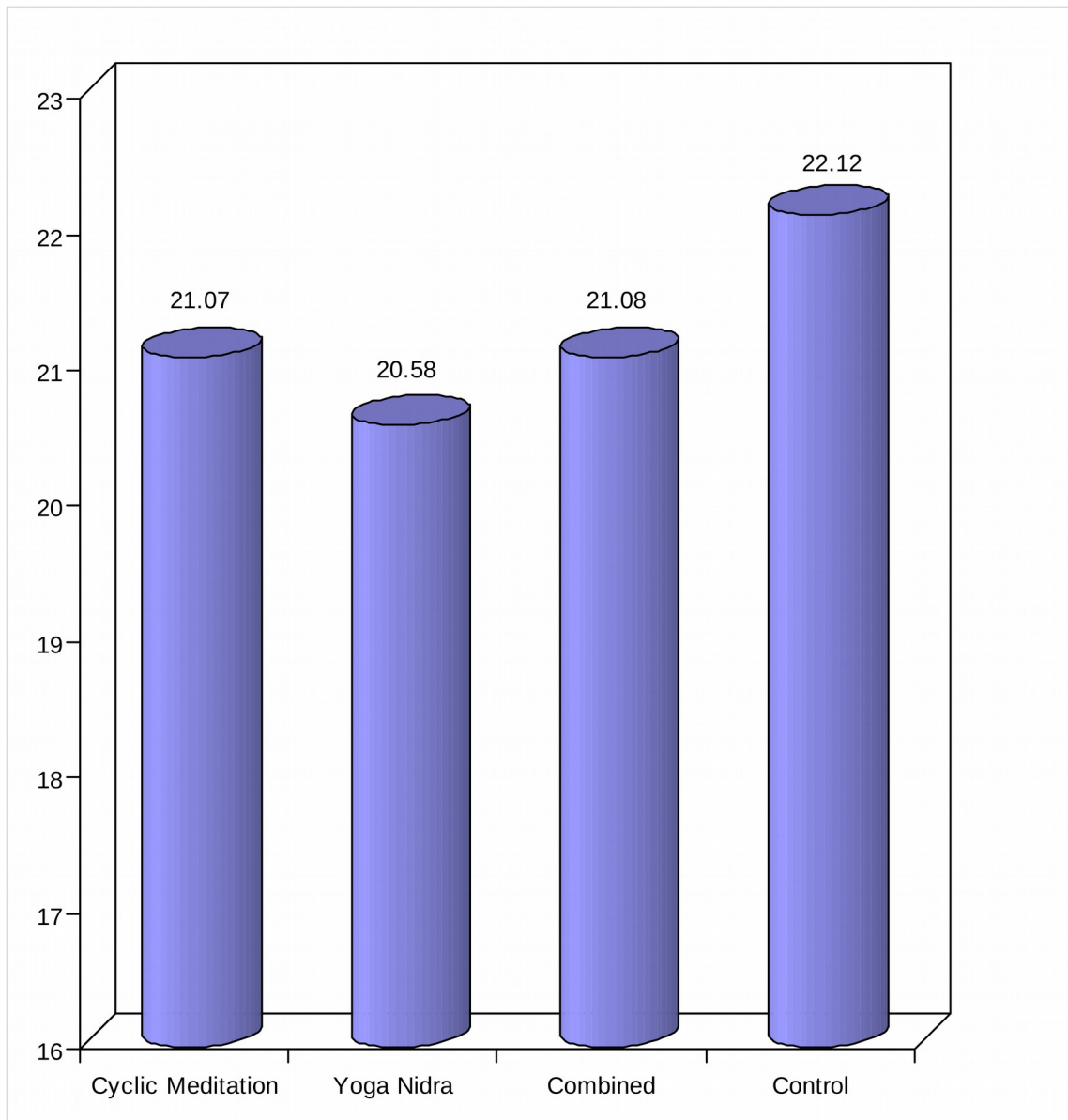


Fig.19. Final Means on Hostile Aggression of the Experimental and Control groups

It is therefore concluded that if a choice has to be made out of the three meditation programmes i.e. Cyclic Meditation, Yoga Nidra and Combined Meditation for reducing Pulse Rate and Respiratory Rate in athletes, the Combined Meditation programme should be preferred. Furthermore, the findings do indicate that a choice has to be made out of three meditation programmes namely Cyclic Meditation, Yoga Nidra and Combined Meditation for improving Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety and Self Confidence, any one of the meditation programme can be opted for.

On the other hand, none of the training programmes namely Cyclic Meditation, Yoga Nidra and Combined Meditation were found to be effective in reducing Instrumental Aggression. Whereas, if a choice has to be made out of three meditation programmes namely Cyclic Meditation, Yoga Nidra and Combined Meditation, Yoga Nidra should be preferred for reducing the Hostile Aggression.

Thus overall results do indicate that the Combined Meditation programme is significantly effective than Cyclic Meditation, Yoga Nidra and Control group in case of Pulse Rate and Respiratory Rate. Furthermore, all the experimental groups namely Cyclic Meditation, Yoga Nidra and Combined Meditation groups were found to be significantly effective than Control group on Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety and Self Confidence. Whereas, no significant difference was found between Cyclic Meditation and Yoga Nidra on any of the selected variables. The findings also reveal that both Cyclic Meditation and Yoga Nidra were equally effective on all the variables. Cyclic

Meditation and Combined Meditation groups are found to be significantly better than the Control group on all the variables except in Instrumental Aggression and Hostile Aggression. Yoga Nidra group is found to be significantly better than the Control group in Hostile Aggression. Instrumental Aggression was found to be ineffective by Cyclic Meditation, Yoga Nidra and Combined Meditation groups.

Discussion of Findings

The results of the study indicate significant improvement in all the selected physiological variables namely Pulse Rate, Respiratory Rate, Body Temperature, Systolic Blood Pressure, Diastolic Blood Pressure and the psychological variables such as Cognitive Anxiety, Somatic Anxiety, and self Confidence after Cyclic Meditation, Yoga Nidra and Combined Meditation programmes. This might be due to the fact that the experimental training programmes of Cyclic Meditation, Yoga Nidra and Combined Meditation were conducted with utmost care in terms of duration, frequency, timing and time for adaptation. Another important factor for these significant differences might be due to the fact that the subjects were exposed to a highly systematic and scientifically designed training programme for the first time other than their regular physical training.

In case of Pulse Rate and Respiratory Rate, it was found that all the training programmes were not equally effective to reduce Pulse Rate and Respiratory Rate to a more normal state. The Cyclic Meditation, Yoga Nidra and Combined Meditation groups obviously had shown better performance on Pulse Rate and Respiratory Rate as compared to Control group. It was also found that the Combined Meditation group

was significantly better than Cyclic Meditation group and Yoga Nidra group in reducing Pulse Rate and Respiratory Rate.

In case of Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety, it was found that all the training programmes were equally effective for reducing to a more normal state. The Cyclic Meditation, Yoga Nidra and Combined Meditation groups were equally effective to reduce the Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety. On the other hand, it was found out that, there existed no significant difference among the Cyclic Meditation, Yoga Nidra and Combined Meditation groups.

These finding might be due to the fact that the Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety are the physiological indications of stress found in athletes, the stimulatory asanas included in Cyclic Meditation namely Tadasana, Ardhakati Chakrasana, Pada Hastasana, Ardha Chakrasana, Vajrasana, Sasankasana and Ustrasana and the relaxation techniques included in the Cyclic Meditation namely Instant Relaxation Technique, Quick Relaxation Technique and Deep Relaxation Technique might have collectively contributed to reduce the Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety in the Cyclic Meditation group.

Another factor which might have contributed to this finding is that, in Cyclic Meditation by the practice of successive stimulations and relaxations, the

suggestibility of the athletes might have drastically improved and the instruction given in the Cyclic Meditation might have been received by the athletes without any filtration. Furthermore, in the practice of Cyclic Meditation the sub conscious mind might have awoken and the athletes might have experienced a state of 'Sleep but awake' during the practice. In this state athletes might have experienced complete relaxation thereby reducing the activities and functions of the brain which might have also acted as a causative factor for the reduction in Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety. Another reason might be due to the decreased metabolic rate followed by the complete relaxation attained in the Cyclic Meditation process. These findings are in consensus with the finding of Telles et.al (1997) and Telles, Rajesh and Srinivas (1999).

Findings related to the effectiveness of Yoga Nidra for the reduction of the Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety in athletes might be due to the fact that the techniques used in Yoga Nidra such as Resolve, Rotation of consciousness, Awareness of breath, feeling and sensations and Visualization collectively stand as the causative factors to reduce Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety in athletes.

In Yoga Nidra, by the practice of Rotation of consciousness, Awareness of breath, feeling and sensations and Visualization, the suggestibility of the athletes might have been drastically improved and the instruction given in Yoga Nidra might

have been received by the athletes without any filtration. These might be the reason for reducing the Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety. Furthermore, in Yoga Nidra, the athletes might have experienced the withdrawal of consciousness and arousal of the subconscious mind. In this state, the athletes might have experienced a special state of mind that 'awakens in sleep' during the practice. In this state, athletes might have experienced the ultimate relaxation and the brain activities and functions might have been reduced. This also might have acted as a causative factor for the reduction in Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety. Another reason for these findings might be due to the decreased metabolic rate followed by the complete relaxation attained in the Yoga Nidra process which might have reflected in the physiological indications of stress i.e. Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety. These findings are in consensus with the finding of Bhatta and Kumar (2000), Telles and Desiraju (1992) and Datey and Bhagat (1977).

The results showed that the Combined Meditation group was significantly better than the Cyclic Meditation and Yoga Nidra group in reducing Pulse Rate and Respiratory Rate. The effectiveness of Combined Meditation group in reducing Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety and Somatic Anxiety might be due to the involvement of both meditation techniques i.e. Cyclic Meditation and Yoga Nidra. It

is further opined that since the athletes in the Combined Meditation group were subjected to the influence of Cyclic Meditation as well as the Yoga Nidra alternatively, they might not have experienced the monotonous feeling of practicing a single meditation technique and thereby might have actively participated in the training programme. So it is obvious that, the Combined Meditation group not only might have got the benefits of Cyclic Meditation and Yoga Nidra but they have avoided the boredom of practicing any one of them in the training programme. This might be the reason for the effectiveness of Combined Meditation group over Cyclic Meditation and Yoga Nidra in reducing Pulse Rate and Respiratory Rate. These findings are in consensus with the findings of Prapavessis et.al (1992).

In case of Self Confidence it was found that all the training programmes were equally effective to improve Self Confidence. The Cyclic Meditation, Yoga Nidra and Combined Meditation groups were found to be effective in improving Self Confidence as compared to Control group. It was also found that there existed no significant difference among the Cyclic Meditation, Yoga Nidra and Combined Meditation groups.

The results show that Self Confidence, which is a very important factor for athletic performances have improved with psychological interventions of Cyclic Meditation, Yoga Nidra and Combined Meditation.

The combination of successive stimulations and relaxation techniques used in Cyclic Meditation might have resulted in improvement of Self Confidence in athletes or in other words, stimulation asanas and relaxation techniques included in Cyclic

Meditation might have collectively contributed to improve Self Confidence in the Cyclic Meditation group.

Furthermore, the study also reveals that the effectiveness of Yoga Nidra have improved Self Confidence in the athletes, this might be due to the fact that the techniques used in Yoga Nidra such as Resolve, Rotation of consciousness, Awareness of breath, feeling and sensations and Visualization might have collectively stood as causative factors for improving Self Confidence in athletes.

The results also show that the Combined Meditation was effective in improving Self Confidence, as the effectiveness of Combined Meditation group in improving Self Confidence might be due to the involvement of both meditation techniques namely Cyclic Meditation and Yoga Nidra.

Another findings of this study is that all the training programmes were not effective in improving Instrumental Aggression. The Cyclic Meditation, Yoga Nidra and Combined Meditation groups have shown significant improvement in the t-test, though no significant difference was found in the analysis of covariance. Hence it is concluded that the significant differences seen in the t-test of pre and post test mean scores of Instrumental Aggression might be due to the sampling error. Since the analysis of covariance provides an adjustment in the final scores as per the differences in the initial scores, it is obvious that no treatments were significantly effective in improving Instrumental Aggression of athletes.

The reason behind the ineffectiveness for improvement in Instrumental Aggression in Cyclic Meditation, Yoga Nidra and Combined Meditation groups might

be due to absence of specific psychological suggestions during the course of the training programmes.

Another finding is that none of the training programmes were found to be effective in reducing the Hostile Aggression except Yoga Nidra. The Cyclic Meditation and Combined Meditation groups had shown significant improvement in the t-test, though no significant differences were found in the analysis of covariance. Hence it is concluded that the significant differences seen in the t-test of pre and post test means of Hostile Aggression of the Cyclic Meditation and Combined Meditation groups were due to the sampling error. Since, analysis of covariance provides an adjustment in the final scores as per the differences in the pre test scores, it is obvious that Cyclic Meditation and Combined Meditation groups were not significantly effective in improving Instrumental Aggression of athletes. Besides, no significant differences have been found among Cyclic Meditation, Combined Meditation and Control group in Hostile Aggression in ANCOVA, it do indicates that Cyclic Meditation and Combined Meditation groups were not effective in reducing Hostile Aggression in athletes. The reason behind the ineffectiveness might be due to the absence of psychological suggestion for reducing Hostile Aggression in Cyclic Meditation and Combined Meditation programmes.

On the other hand, the Yoga Nidra group had shown significant difference over the Control group in ANCOVA. The reason behind the effectiveness of Yoga Nidra over the Control group might be due to the flow of continuity of practice and the techniques used in Yoga Nidra such as Resolve, Rotation of consciousness, Awareness of breath, feeling and sensations and Visualization might have collectively

influenced as a causative element to reduce Hostile Aggression in athletes. Another reason thought to be for the effectiveness of Yoga Nidra over Cyclic Meditation and Combined Meditation programme might be the absence of stimulation asanas in Yoga Nidra.

Discussion of Hypotheses

The Hypothesis that there will not be any significant effect following the three meditation training programmes namely Cyclic Meditation, Yoga Nidra and Combined Meditation techniques on physiological variables namely Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature and the psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression of sports persons, as all the three experimental training programmes brought about significant improvement from pre to post tests on all the selected variables. The hypothesis that there would not be any significant difference between pre and post test means of three meditation techniques namely Yoga Nidra, Cyclic Meditation and Combined Meditation group on physiological variable Pulse Rate and Respiratory Rate was rejected as all the three experimental training programmes brought about significant reduction of Pulse Rate and Respiratory Rate from pre to post test.

As all the experimental training programmes were found to have significant differences between pre and post test means on all the selected physiological variables namely Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood

Pressure and Body Temperature, the first, second, third, fourth and fifth hypothesis duly formulated are rejected.

As all the experimental training programmes were found to have significant differences between pre and post test means on all the selected psychological variables namely Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression, the sixth, seventh, eighth, ninth and tenth hypothesis duly formulated are rejected.

The eleventh, twelfth, thirteenth, fourteenth and fifteenth hypothesis duly formulated with regard to the physiological variables namely Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature are rejected, as significant differences in means have been found among the three experimental groups and the control group.

The sixteenth, seventeenth and eighteenth hypothesis duly formulated with regard to the psychological variables namely Cognitive Anxiety, Somatic Anxiety, and Self Confidence are rejected, as significant differences in means have been found among the three experimental groups and the control group.

The hypothesis number nineteenth duly formulated with regard to the psychological variable Instrumental Aggression is accepted since no significant differences in means have been found among the experimental groups such as Yoga Nidra, Cyclic Meditation and Combined Meditation and the Control group.

The hypothesis number twenty duly formulated with regard to the psychological variable Hostile Aggression is partially accepted as significant differences in means have been found only between Yoga Nidra and Control group. While it is partially accepted as no significant differences have been found between the other two experimental groups namely Cyclic Meditation and Combined Meditation group and the Control group.

Biju Lona K. “Effect of Cyclic Meditation and Yoga Nidra on Selected Physiological and Psychological Variables in College Level Athletes”., Thesis. Department of Physical Education, University of Calicut, 2008.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

All the meditation programmes are focused on calming down the mind. The aim of all meditations is same though the methods and techniques used are varied. Cyclic Meditation, Yoga Nidra and Combined Meditation which is the combination of Cyclic and Yoga Nidra are different and unique. The purpose of the study was to find out the effect of three meditation programmes on physiological variables such as Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Body Temperature and psychological variables such as Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression

At the initial stage 114 sports persons under Calicut University were randomly selected as subjects prior to the pre test data collection. After the pre test data collection forty male and forty female sports persons were finally selected as subjects for the study based on their attitude, enthusiasm and interest towards the study shown at the time of pre test data collection. They were randomly divided into four groups and each group consisted of ten male and ten female sports persons. Group A underwent Cyclic Meditation, Group B underwent Yoga Nidra, Group C underwent a combination of Cyclic Meditation and Yoga Nidra while Group D acted as a Control group. The age of the subjects ranged between 17 to 25 years. The variables selected for the study were Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety, Self Confidence, Instrumental Aggression and Hostile Aggression

The experimental groups underwent the experimental training programmes for a period of twelve weeks with three training sessions in a week. Group A was the Cyclic Meditation group which was given Cyclic Meditation programme consisting of three relaxation programme such as Instant Relaxation Technique (IRT), Quick Relaxation Technique (QRT), Deep Relaxation Technique (DRT) and seven *asanas* such as Tadasana, Ardhakati Chakrasana, Pada Hastasana, Ardha Chakrasana, Vajrasana, Sasankasana and Ustrasana. Group B was given Yoga Nidra consisting of Resolve, Rotation of consciousness, Awareness of breath, feeling and sensations and Visualization. Group C was given Cyclic Meditation and Yoga Nidra Meditation alternatively. Group D served as a Control group and was not given any specific meditation programme.

The subjects underwent their respective training programme under the strict supervision of the research scholar. All the subjects involved in the meditation programme were enquired about their stature, mood and health. None of them reported any difficulties or discomfort during the training period.

The pre test and post test data on the selected physiological variables of the three experimental and control group such as Pulse Rate, assessed by palpation of radial artery at the thumb side of the wrist on the anterior surface of the forearm, Respiratory Rate, assessed by counting the rise and fall of the chest, Body Temperature, measured by using a thermometer and Systolic and Diastolic Blood Pressure were measured by using a sphygmomanometer.

The pre test and post test data on the selected psychological variables of the three experimental and control groups such as Cognitive Anxiety, Somatic Anxiety and Self Confidence were assessed by the Competition State Anxiety Inventory

(CSAI-2) developed by Martens et. al. and the Instrumental Aggression and Hostile Aggression were assessed by Inventory for Sports Aggression (ISA) developed by Jayan and Santosh.

The pre and post test data on the selected physiological and psychological variables of the three experimental and control groups were subjected to t-test. While on the other hand, F-ratio was employed to find out significant differences in means among the three experimental and control groups. The LSD post hoc test was applied, wherever the F-ratio was found to be significant, in order to find out whether the significance of difference among the paired adjusted post means actually exist or not. The level of significance chosen was 0.05.

Conclusions

On the basis of the results of the study the following conclusions were drawn

- 1) The Cyclic Meditation group showed significant improvement and change from pre to post test means on eight selected variables namely Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety and Self Confidence.
- 2) The Yoga Nidra group showed significant improvement and change from pre to post test means on nine selected variables namely Pulse Rate, Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety, Self Confidence and Hostile Aggression.
- 3) The Combined Meditation group showed significant improvement and change from pre to post test means on eight selected variables namely Pulse Rate,

Respiratory Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Body Temperature, Cognitive Anxiety, Somatic Anxiety and Self Confidence.

4) The Combined Meditation group showed significantly better results than Cyclic Meditation, Yoga Nidra and Control group on Pulse Rate and Respiratory Rate.

5) All the three experimental training programmes namely Cyclic Meditation, Yoga Nidra and Combined Meditation programmes showed significantly better performance and change as compared to Control group on all the variables except Hostile Aggression and Instrumental Aggression.

6) The Yoga Nidra group showed significantly better results than Control group on Hostile Aggression.

7) No significant difference was found among the three experimental groups and the Control group on Instrumental Aggression.

8) No significant difference was found between Cyclic Meditation and Yoga Nidra groups in any of the variables.

Recommendations

On the basis of the results of the study and the conclusions drawn the following recommendations are made.

- 1) It is recommended that Combined Meditation consisting of Cyclic Meditation and Yoga Nidra be made use of during the training programme for reducing the pre competition anxiety and stress of the athletes and thereby improving sports performance.
- 2) It is recommended that coaches and Physical Education teachers employ different types of meditation techniques namely Cyclic Meditation, Yoga

Nidra or Combined Meditation along with the normal training programme for improving relaxation, reducing stress and anxiety thereby improving the performance.

- 3) Similar studies may be conducted for finding out the effect of meditation on stress related bio chemical variables such as adrenalin, nor-adrenalin, corticosteroid, thyroxin, ACTH and TSH etc.
- 4) Similar game vice studies may be conducted for finding out the differences on the selected variables on various meditation techniques.
- 5) Similar gender wise studies may be conducted to observe the gender differences if any, on the selected variables.
- 6) It is also recommended that further studies may be conducted to find out the effects of other meditation techniques namely Vipasana Meditation, Transcendental Meditation etc. on physiological and psychological variables of athletes.

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Appendix-A

**RAW SCORES ON PULSE RATE OF EXPERIMENTAL
AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
80	68	80	70	80	62	78	78
80	70	80	68	82	64	80	78
78	66	82	62	78	64	82	82
78	69	80	66	76	62	80	78
82	58	82	64	78	68	80	80
78	68	78	66	78	66	78	78
80	68	80	70	80	70	78	78
82	66	78	68	78	64	78	78
78	70	78	68	80	64	76	78
78	68	80	64	82	68	80	80
80	66	82	68	78	62	78	76
82	67	76	66	78	66	80	80
78	66	76	64	80	62	78	76
82	68	80	70	80	62	80	78
78	64	80	66	78	64	78	80
78	64	78	68	80	64	80	80
80	66	82	66	80	62	78	78
78	68	80	60	78	68	78	76
82	66	80	64	78	64	80	78
80	69	78	70	80	66	78	78

Appendix-B

**RAW SCORES ON RESPIRATORY RATE OF EXPERIMENTAL
AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
19	16	20	17	20	16	20	22
20	16	19	16	18	16	18	18
20	18	18	16	22	14	20	20
20	18	20	18	21	15	22	22
22	17	22	17	20	15	20	18
21	18	20	18	20	16	22	20
18	18	18	18	22	18	20	20
22	17	21	16	20	14	22	20
20	18	20	18	22	16	20	20
20	18	20	18	21	16	20	20
19	16	20	17	20	14	18	18
22	16	21	17	20	18	20	22
18	16	18	16	20	14	20	20
22	18	22	18	22	16	20	18
18	16	20	17	20	15	18	18
20	16	20	16	21	16	20	20
22	18	18	16	20	14	20	20
22	17	22	19	20	18	20	20
20	18	18	16	18	16	22	20
18	16	20	18	22	16	18	18

Appendix-C

**RAW SCORES ON SYSTOLIC BLOOD PRESSURE OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
130	120	130	118	134	120	134	130
130	118	140	122	140	120	140	142
132	118	132	120	136	120	136	134
130	120	128	120	126	116	126	126
128	118	130	118	134	118	134	134
140	120	134	118	130	116	130	128
134	118	140	120	138	120	138	136
126	120	126	116	130	116	130	130
134	116	136	118	134	122	132	130
138	120	140	116	138	118	138	136
130	118	132	118	128	120	128	128
136	116	134	120	130	118	130	132
138	118	138	122	132	118	132	130
132	116	140	120	136	116	136	136
134	120	132	118	134	120	134	132
136	118	132	116	137	120	136	136
132	118	138	118	136	118	136	134
134	118	132	120	134	116	134	136
132	118	130	118	132	118	132	134
138	120	132	120	134	120	134	134

Appendix-D

**RAW SCORES ON DIASTOLIC BLOOD PRESSURE OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
98	72	94	76	96	76	98	96
100	78	96	80	102	78	102	98
98	78	98	74	98	74	98	98
94	76	90	76	90	78	88	90
92	78	92	76	96	76	96	94
100	78	98	78	92	74	94	92
98	74	94	78	100	76	100	96
98	76	92	78	92	78	92	90
96	76	98	76	96	76	94	94
98	78	102	78	100	76	100	98
94	78	98	76	90	78	90	88
96	76	94	78	92	78	92	94
98	78	100	74	100	80	96	96
102	76	104	78	98	78	98	100
96	78	98	78	96	74	96	96
98	78	98	74	100	78	100	96
98	72	100	76	98	80	98	100
96	78	98	78	96	78	96	98
96	78	102	78	98	74	98	94
98	74	94	80	96	76	96	94

Appendix-E

**RAW SCORES ON BODY TEMPERATURE OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
99	97	98	97	102	98	100	99
98	97	97	96	100	96	104	102
102	98	102	100	98	98	102	102
103	99	100	98	102	100	100	99
104	98	99	97	106	98	103	102
102	96	100	96	99	97	100	100
99	97	97	96	104	96	99	100
98	96	100	97	102	98	100	100
102	97	102	98	104	97	104	102
103	98	102	100	102	96	100	99
104	98	103	100	104	97	98	98
105	98	98	98	104	100	100	100
104	102	102	98	102	98	100	102
102	98	102	97	104	96	102	102
99	97	100	98	100	98	99	99
98	98	97	97	102	97	100	98
98	98	99	98	100	97	104	104
100	97	102	100	98	96	104	104
102	99	98	97	104	98	102	100
104	98	102	99	102	96	104	104

Appendix-F

**RAW SCORES ON COGNITIVE ANXIETY OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
27	24	32	26	30	26	30	28
28	25	30	24	26	22	28	28
27	24	28	20	28	18	29	30
30	20	28	22	32	19	32	31
30	20	30	22	32	20	28	28
29	20	32	18	30	22	28	30
31	22	30	22	32	20	29	28
29	21	29	20	28	22	32	32
30	24	26	22	29	18	32	30
28	20	32	20	30	22	30	30
26	18	30	20	28	20	28	29
20	19	28	22	22	17	26	26
25	20	28	24	24	18	28	28
26	19	28	18	26	20	30	31
30	18	30	22	32	22	32	30
32	17	26	20	28	19	28	26
29	19	24	22	26	20	30	31
28	21	28	20	26	22	30	29
27	22	28	22	30	18	32	32
28	23	30	24	29	20	30	29

Appendix-G

RAW SCORES ON SOMATIC ANXIETY OF EXPERIMENTAL
AND CONTROL GROUPS

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
28	25	30	20	30	26	30	29
27	24	32	18	28	22	28	28
30	18	28	20	32	20	32	30
32	24	30	19	30	28	28	28
29	22	32	18	30	24	30	30
32	22	30	22	29	18	31	32
30	18	29	24	32	22	28	29
32	24	30	18	28	18	32	32
29	22	32	23	30	20	30	28
32	22	29	24	30	24	28	26
29	19	30	22	32	20	30	30
29	20	32	20	30	22	31	31
30	24	28	18	32	20	32	31
32	23	32	20	28	20	30	29
28	19	30	22	30	20	29	28
29	20	28	22	26	22	28	30
28	18	29	22	30	20	30	30
28	20	30	22	26	22	28	28
30	20	30	26	32	22	32	31
24	18	32	22	26	20	30	30

Appendix-H

**RAW SCORES ON SELF CONFIDENCE OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
27	29	28	30	26	30	28	29
26	28	27	28	27	28	27	27
28	28	26	30	26	32	27	26
24	26	28	28	24	30	28	27
30	32	30	32	26	28	30	30
28	30	26	28	28	32	29	29
23	26	26	30	26	30	24	26
28	30	26	32	24	28	30	28
32	32	30	32	24	26	28	28
29	31	29	32	28	30	28	30
27	29	26	28	30	32	30	28
26	28	24	28	26	28	28	27
26	30	26	32	28	30	28	28
28	30	30	32	28	30	30	30
30	32	28	28	28	28	32	32
28	30	26	28	32	32	28	29
30	32	28	30	26	30	32	30
29	30	30	32	28	30	30	31
28	30	27	30	30	32	30	30
26	28	28	30	28	30	28	29

Appendix-I

**RAW SCORES ON INSTRUMENTAL AGGRESSION OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
26	28	28	29	30	32	26	26
30	30	28	26	24	27	28	29
32	34	30	29	30	32	30	30
28	26	29	32	32	32	28	28
29	30	30	28	30	30	29	29
28	30	32	33	29	32	30	30
32	34	30	32	28	30	34	34
30	32	28	30	28	32	32	30
32	34	30	32	30	30	28	29
32	32	28	26	28	32	32	31
30	30	30	32	32	32	30	30
28	28	32	30	28	30	28	28
24	24	26	26	30	31	24	24
26	26	24	28	28	26	26	25
29	30	30	32	28	26	29	29
28	27	29	29	29	29	28	27
28	28	27	30	30	28	28	29
30	32	30	32	28	32	30	32
26	30	28	30	28	26	26	38
28	30	26	30	30	32	20	22

Appendix-J

**RAW SCORES ON HOSTILE AGGRESSION OF
EXPERIMENTAL AND CONTROL GROUPS**

Cyclic Meditation Group		Yoga Nidra Meditation Group		Combined Meditation Group		Control Group	
Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
18	18	20	20	24	22	22	21
20	18	18	16	20	18	24	24
24	22	19	17	20	18	24	25
18	18	20	18	18	18	26	26
24	24	22	20	20	20	24	22
24	23	18	16	22	20	24	24
26	24	26	24	24	24	26	26
25	25	26	24	24	22	25	26
24	24	22	20	20	18	24	24
26	24	24	24	22	20	26	26
18	16	20	16	20	19	18	16
20	18	21	20	18	18	20	20
19	18	20	18	18	17	19	18
22	20	22	19	20	20	22	22
24	22	24	18	22	20	25	24
26	24	24	22	24	22	26	26
24	22	25	25	22	22	24	24
26	24	24	23	20	18	26	26
22	22	26	25	24	22	22	22
22	20	24	24	22	20	22	22