

CHAPTER I

INTRODUCTION

An ideal man should be strong, healthy, broadminded and active. Hardman A, Stensel D (2009) opines that “Activity is life while stagnation is death.”

Proper growth and maintenance of good health, participation in daily physical activities is an indispensable one. The high level of physical fitness comes from years of daily experience in a selected variety of vigorous physical activities. It is a biological principle that function builds structure and structure decides function. Man needs vigorous exercises for growth and development. To perform the daily activities in a more efficient manner, a condition of muscles, their strength and endurance are essential to man. A muscle must be overloaded in order to be strengthened. (Hardman A, Stensel D (2009)

Every human being participates in some kind of sports activity or physical exercise during the course of his life. This exercise may assume different forms for different individuals. It may be walking, jogging, cycling, working in a factory, participation in games and sports etc. Regular participation in exercise programme markedly influences physical, physiological and mental fitness of an individual.

1.1 OBESITY

While exercising our muscles burn both fat and glucose (carbohydrates in the blood) in different proportions. Depending on how an individual exercises muscle can burn fat in a larger proportion to glucose.

When activity is light and easy we tend to burn a much higher percentage of fat. Fat is a slow burning fuel that requires oxygen so if oxygen is delivered to muscle cells in sufficient quantities the cells can easily burn fat for most of its energy requirement. A potential problem for weight loss is lighter exercise burns fewer total calories.

If an individual increases their effort by performing a more intense exercise they will burn more calories however, because oxygen cannot always be delivered to the hard-working cells in sufficient quantities, cells are forced to burn more carbohydrates in order to keep up with increasing demand. If the level of exertion continues to increase then glucose eventually becomes the predominant energy source for muscles as this quick-burning fuel does not require oxygen.

It means to burn fat directly we should exercise at a lower level of effort and for longer duration. However some people just don't have the time to exercise for longer periods. The only way to burn fat quickly is to increase the metabolism through anaerobic exercise so we burn the fat indirectly.

Obesity: which leads to, a) Diabetes, b) Chronic heart diseases, c) Deterioration of brain functions, d) Acceleration of aging process and e) Deteriorated musculo-skeletal system.

All exercise burns calories for they involve movements and energy is required for every movement made. The calorie burning ability of each exercise depends on the speed and/or force at which the exercise is performed. This proves the calorie burning potential of an exercise can be increased depending on an individual's motivation for that movement.(Kushner, Robert (2007)

1.2 NEED FOR BURNING OUT FAT

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It means to burn fat directly we should exercise at a lower level of effort and for longer duration. However some people just don't have the time to exercise for longer periods. The only way to burn fat quickly is to increase the metabolism through anaerobic exercise so we burn the fat indirectly. Fitness expert Tom Venuto has taught thousands of people worldwide exactly how to use certain exercises to burn fat fast.

1.3 YOGA

Yoga is the universal religion, a way of life, which is above all castes, creeds, languages, regions and nations. Yoga consists of eight Angas or Parts, namely, Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dyana and Samadhi. All these put together stands for yoga. Yamas and Niyamas are to be given to the children upto the age of puberty, that is, upto twelve years of age. Asanas and Pranayama constitute the aspect of physical training in the field of yoga. These should be introduced only from the age of twelve onwards and never before that age. Children under twelve possess a very mobile spinal column. Asanas are supplying agents and the children under twelve, positively need only strengthening exercises and not supplying exercises at all.(Sharma, et al. 2012)

Yoga is defined as the silencing of the mind's activities which leads to complete realisation of the intrinsic nature of the supreme being. It is universal, benefiting all people of all ages. The study of yoga is fascinating to those with a philosophical mind. It is a practical holistic philosophy designed to bring about profound state of well being to body, mind and spirit. Yoga is also said to be harmony. It is thus an integral subject, which takes into consideration man as a whole. The aim of yoga is to devise ways and means of helping the body and mind to maintain their state of balance. Yoga helps one to achieve better emotional and intellectual concentration.

According to Sharma, et al. (2012) the aim of yogasanas is not only to develop the muscles and the body but also to regulate the proper activities of all the internal organs and glands that affect the nervous system and that which control our well being to a much greater degree than we actually suppose.

Narendra Prasad (1995), stated that yoga has played a key role in changing the prisoners mentality, developing their personality and in converting them into law-abiding citizens.

Yoga deals with health, strength and conquest of the body. Next, it lifts the veil of difference between the body and the mind. Asanas purify the body and mind and have preventive and curative effects. They are innumerable, catering to the various needs of the muscular, digestive, circulatory, glandular, nervous and other systems of the body. It brings health, beauty, strength, fitness and expression, calmness of the nerves and happy disposition.

1.4 ASANAS

Asana means holding the body in a particular posture to bring stability to the body and poise to the mind. The practice of asana being purity in tubular channels, firmness to the body and vitality to the body and the mind.

Yogasanas are simple actions for keeping the internal and external parts of the body in good health. No activity can be performed well so long as the internal and external parts of the body are not in good health. The body and the mind are closely related. The people of ancient Greece believed in the principle “A sound mind in a sound body.” By practicing asanas one possess himself from physical disabilities and mental distractions. It is a state of complete equilibrium of body, mind and spirit.

Asana means a state of being in which one can remain steady, calm, quiet, and comfortable, physically and mentally. Yogasana are practiced to develop one’s ability to sit in one position without discomfort for extended lengths of time, as this is necessary during meditation. (Sharma, et al. 2012)

1.5 PRANAYAMA

The word pranayama consists of two parts “Prana” and “yama”. Prana means breath, life, vitality or cosmic energy. Ayana means control. Thus pranayama means control of the vital force by regulated breathing.

Asanas and pranayama constitute the aspect of physical training in the field of yoga. These should be introduced only from the age of twelve onwards and never before that age. Children under twelve possess a very mobile spinal column.

When Pranayama and asanas are done together the perfect posture is not disturbed. One soon realizes that when asanas are well performed, pranayamic breathing automatically sets in. The practice of Pranayama develops a steady mind, strong will power and sound body. (Iyengar, 1983)

Pranayama is the fourth anga in the field of yoga. This is highly beneficial to increase the longevity. The purpose of Pranayama is to make the respiratory system function at its best. The respiratory system is the gateway to purifying the body mind and intellect. (Iyengar, 1983)

1.6 SYSTEMS OF YOGA

The philosophical schools of Hinduism, Buddhism and Jainism were taking form and a coherent philosophical system of yoga began to emerge.

1.6.1 BHAKTI YOGA

Bhakti Yoga emphasizes on the love and devotion to the Almighty. The individual performing this type of Yoga concentrates on the existence of Almighty. He/she learns to show love, compassion to the creatures co-existing with him/her, apart from keenly worshipping the Lord. Bhakti Yoga can be

practiced in a number of ways, such as praising the God by singing, chanting slogans, reading religious books, listening to prayers and by watching religious movies.

1.6.2 HATHA YOGA

Hatha Yoga was founded by Yogi Swatmarama in the 15th century in India. This type of Yoga is all about the combination of two extremes - 'ha' (the Sun, regarded as the positive current) and 'tha' (the Moon, regarded as the negative current). It involves the performance of physical postures (Asanas), breathing exercises (Pranayams), meditation, mudras and purification procedures known as 'Shatkriyas'.

1.6.3 JNANA YOGA

The Yoga of true knowledge, Jnana Yoga aims to detach the person performing it, from all the temporary things of the life. The person doing it attains tranquility, control over his/her mind, sense, faith, ability for concentration and the endurance to withstand the play of opposites by Mother Nature. By practising Jnana Yoga, the individual stays single-minded in all situations and attains self-control.

1.6.4 KARMA YOGA

As the name suggests, Karma Yoga is the dedication of all the actions (karma) and their fruits to the Almighty. This type of Yoga purifies one's heart,

and helps attain the knowledge of one's own self. The aim of a Karma Yogic (one, who performs Karma Yoga) is to provide selfless service to the poor and the needy, without expecting money, fame, power, respect and honor in return of the service.

1.6.5 KUNDALINI YOGA

Kundalini Yoga aims at drawing the untapped energy (Kundalini), coiled at the base of the spine, by using a set of technique that uses the person's mind, senses and body. Apart from the physical postures (Asanas), the person performs meditation, chants mantras in order to awaken each of the seven chakras of the body. The Asanas are coordinated with the hold of breath control.

1.6.6 MANTRA YOGA

Mantra Yoga, as the name suggests, makes use of mantras to attain a peace of mind and increase the concentration power. The mantras are chanted by the person in a thoughtful way, in order to attain certain goals. Mantra Yoga helps eliminate a number of disorders, including psychosomatic ailments and the problems of anxiety, stress and tension. It boosts the person's self-confidence as well.

1.6.7 PURNA YOGA

Known as integral Yoga, Purna Yoga offers wisdom and techniques for the unison of the body, mind and soul. It emphasizes the Karma of your

everyday life. It involves meditation, pranayams and the performance of alignment-based Asanas. Purna Yoga is an improvisation of the traditional systems of Yoga.

1.6.8 RAJ YOGA

Raj Yoga is the best way for the complete and holistic healing of one's mind and soul. This type of Yoga helps a person to alleviate himself/herself from the emotional and mental conflicts. Also called Astanga or eight-limbed Yoga, Raj Yoga helps the person to be in harmony with the co-existing creatures and the environment. (White, David Gordon (2012))

1.7 BENEFITS OF YOGA

1.7.1 PHYSIOLOGICAL BENEFITS OF YOGA

The following physiological benefits are reported by different researches:

- Stable autonomic nervous system equilibrium
- Pulse rate decreases
- Respiratory rate decreases
- Blood Pressure decreases (of special significance for hyporeactors)
- Galvanic Skin Response (GSR) increases
- EEG - alpha waves increase (theta, delta, and beta waves also increase during various stages of meditation)
- EMG activity decreases
- Cardiovascular efficiency increases

- Respiratory efficiency increases
- Gastrointestinal function normalizes
- Endocrine function normalizes
- Excretory functions improve
- Musculoskeletal flexibility and joint range of motion increase
- Breath-holding time increases
- Joint range of motion increase
- Grip strength increases
- Eye-hand coordination improves
- Dexterity skills improve
- Reaction time improves
- Posture improves
- Strength and resiliency increase
- Endurance increases
- Energy level increases
- Weight normalizes
- Sleep improves
- Immunity increases
- Pain decreases
- Steadiness improves
- Depth perception improves
- Balance improves
- Integrated functioning of body parts improves (Rishi Vivekannada (2005))

1.7.2 PSYCHOLOGICAL BENEFITS OF YOGA

The following psychological benefits are reported by different studies.

- Somatic and kinesthetic awareness increase
- Mood improves and subjective well-being increases
- Self-acceptance and self-actualization increase
- Social adjustment increases
- Anxiety and Depression decrease
- Hostility decreases
- Concentration improves
- Memory improves
- Attention improves
- Learning efficiency improves
- Mood improves
- Self-actualization increase
- Social skills increases
- Well-being increases
- Somatic and kinesthetic awareness increase
- Self-acceptance increase
- Attention improves
- Concentration improves
- Memory improves
- Learning efficiency improves
- Symbol coding improves

- Depth perception improves
- Flicker fusion frequency improves (Bharathi Joshi, (2005))

1.8 NUTRITIONAL SUPPLEMENTATION

Nutrition is the science of foods, the nutrients and other substances there in action, interaction and balance in relationship to health and disease, the processes by which the organism digests, absorbs, transports and utilises nutrients and disposes of their and products.(Willett, Walter C. with Skerrett, Patrick J. (2005))

Proper nutrition is important to the health of an athlete for physical fitness, recuperating fatigued muscles, energy and the repair of damaged tissues. The athlete should include proper amount of carbohydrates, fats, proteins, minerals, vitamins and Water in his or her diet.

A Basic understanding of nutrition and its effects upon health, weight control and Physical performance is essential for all people, including the coach trainers and athlete. An athletes performance may be improved with good and sound nutrition. (Willett, Walter C. and Skerrett, Patrick J. (2005))

1.9 YOGIC DIET

The yogis of ancient times knew this, and many classical yogic texts, such as the Hatha Yoga Pradipika, contain advice on a yogic diet. However, proper diet is a controversial subject. Nutrition has been extensively researched

by modern science, and there seems to be as many 'proper' diets as there are scientific studies. It is more than a bit confusing for someone to devise their own individual diet amidst so much, often contradictory, advice. The advice given below is based on the classical yogic texts and on the author's experience. It also gives pointers for further research and experimentation. (Mouze, 2010)

Unlike modern scientists, yogis are not interested in the chemical content (protein, vitamins, etc...) of the food. Instead, food is traditionally classified according to its effect on the body and mind, using the three Gunas: Sattva (the quality of love, light and life), Raja (the quality of activity and passion, lacking stability) and Tamas (the quality of darkness and inertia, dragging us into ignorance and attachment).

Sattvic food promotes clarity and calmness of mind and is favourable for spiritual growth. It is "sweet, fresh and agreeable" and includes most fruits, nuts, seeds, vegetables, particularly green leafy vegetables, whole grains, honey, pure water and milk (with the reservation that commercially produced milk may not nowadays be so sattvic). Given the amount of pesticides and chemical fertilisers used on commercial crops, only organic products still qualify as Sattvic, and tinned or frozen food certainly don't. (Mouze, 2010)

Rajasic food feeds the body, but promotes activity and therefore induces restlessness of mind. It disturbs the equilibrium of the mind and is generally to be avoided by yoga practitioners. Rajasic foods include most spicy foods,

stimulants like coffee and tea, eggs, garlic, onion, meat, fish and chocolate, as well as most processed food. Eating too fast or with a disturbed mind is also considered rajasic. Rajasic food should be avoided by those whose aim is peace of mind, but will benefit people with an active lifestyle. A little rajasic food can be sattvic, for example, hot spices can help digestion, and therefore help create peace of mind. (Mouze, 2010)

Tamasic food (to be avoided) induces heaviness of the body and dullness of the mind, and ultimately benefits neither. It includes alcohol, as well as food that is stale or overripe. Overeating is also tamasic. The traditional advice is to fill the stomach half with food, one quarter with water, leaving the last quarter empty. (Mouze, 2010).

1.9.1 COMPOSITION OF YOGIC FOOD

Diet plays an important role in the routine of yogic lifestyle. The ancient Yogis were well aware of the value of dietetics. The yogis knew that while food habits could condition the body and the mind, inversely, also certain physiological and psychological states could create an appetite for certain foods. To follow a Yoga diet, one need not necessarily be a Yoga practitioner; a desire to live a better life by following a diet is all required. Yoga diet has been proven over thousands of years to build strong bodies and minds.

Irrespectively, Yoga holds the moral principle of non-violence (Ahimsa), that man really is a herbivore - frugivorous animal. The ideal food for

man that contributes to greater endurance comprises grains, vegetables, nuts, dairy products, fruits, honey and nutritive roots. All nutrients which are pure, pleasant, sweet, nourishing and easily digestible are generally recommended for the yogis to consume. No spices are to be used as these have been found to be invigorating and harmful. Even the use of common salt is considered as harmful to good health. Highly weathered foods and stimulating drinks are prohibited in a Yoga diet. Foods that are sharp, sour, pungent, bitter and heavy are similarly not permissible.

The balanced Yoga diet for the common men should be spaced by an interval of four hours between each meal. Breakfast, while practicing serious Yoga asanas, may consist of milk, a little of whole wheat preparation, honey and dried or fresh fruits. At noon, lunch can be made of a vegetable soup, preparations from grains, fresh green vegetables and roots, salads and fresh curd or buttermilk. In the evening, the practitioner can take fruit juices, nuts and a small quantity of whole wheat preparation or other grains may make up what is generally light refreshment. Dinner is to be taken at least 2 hours before going to bed and the menu should include preparations from grains, green vegetables, dairy products, and juicy fruits. The ratio for the composition of meals in a Yoga diet may be, grains to contain 30 per cent of the calorific value needed for the individual, vegetables and roots 25 per cent, dairy products 20 per cent, fruits and honey 20 per cent, nuts to counter the balance of 5 per cent for a wholesome (Sattvika) diet.

Regarding the quantity of food in Yoga diet, moderation or Mitahara is focused as the guiding line, that means to eat no more or no less than what is completely necessary to suit one`s natural appetite. Fasting or eating once a day is regarded as harmful, just as overeating is in Yoga diet. Stale food and non-nutrients are strictly prohibited. The Yoga Diet is a perfect way to gain the ideal weight and achieve emotional and spiritual balance by redefining the individual`s relationship with food. It`s a branch of Yoga all on its own, called Anna Yoga and it`s not a diet in the sense of addition of calories or complicated menu planning. The Yoga Diet does not require the individual to feel hungry or feel overfilled as well.

The Yoga Diet is suitable for meat eaters as well as vegetarians and those people with allergies and digestive problems. It is an excellent diet for today`s lifestyle where variety is the rule of the day. The Yoga Diet is also a known and trusted path to longevity and enlightenment. The Yoga Diet is one the five principles of Yoga. Within a short period of time, the individual shall notice that eating properly will help to improve the health of the individual and make the person feel fit and cleaner. The Yoga Diet is a perfect complement to Yoga Exercise. Despite the fact that the Yoga Diet is not a diet in the ordinary sense of the word, one will probably lose considerable weight by just eating only healthy foods. Yoga diet also does not restrain itself into purely vegetarian foods.

1.9.2 TYPES OF YOGIC FOOD

In the materialistic universe, energy has three qualities, known as Gunas that exist together in equilibrium. The three Gunas are Sattva (purity); Rajas (activity, passion, the process of change) and Tamas (darkness, inertia). Once energy takes its form, one quality of the three predominates. Thus on an apple tree, some fruits are ripe (sattvic), while some are ripening (rajasic) and some are overripe (tamasic). But no matter what value of the food prevails, an element of each of the other two will always be present as well and parts of the apple will be in all the varied stages. The Three Gunas encompass all existence and all actions.

Sattvic Food is considered to be the purest diet in Yoga diet. These kinds of foods are the most suitable ones for any serious student of Yoga that nourishes the body and maintains it in a peaceful state. Sattvic food calms and purifies the mind, enabling it to function at its maximum potential, leading to true health; a peaceful mind in control of a fit body, with a balanced flow of energy between them. Sattvic foods include milk, cereals, honey and herb teas, legumes, whole meal bread, nuts, sprouted seeds, fresh fruit and vegetables, butter and cheese, seeds, and pure fruit juices.

Rajasic Food is the hot, bitter, sour, dry or salty food that often destroys the mind-body equilibrium, feeding the body at the expense of the mind. Too much of this kind of food will over-stimulate the body and stimulate the passions, thus making the mind restless and uncontrollable. Eating in a hurry is

also considered rajasic. The Rajasic foods include fish, salt and chocolate, eggs, stimulants such as coffee and teas, and sharp spices or strong herbs. Tamasic Food benefits neither the mind nor the body. Prana or energy is withdrawn, powers of reasoning become weak and a sense of lethargy sets in the soul. Overeating is also considered tamasic. The body's resistance to disease is almost destroyed and the mind is filled with dark emotions, such as anger and greed. The tamasic diet include foods like alcohol, meat, tobacco, onions, garlic, stale overripe substances, and fermented foods such as vinegar. Thus the best and ideal Yoga diet is made of Sattvic foods.

Other than serving the mind and soul, Sattvic foods in Yoga diet also helps to keep the physical status of the body fit. Statistically, compared to meat eaters, vegetarians have a lower incidence of heart attack, stroke, kidney disease, and cancer; their resistance to disease is comparatively higher; and they are less likely to suffer from obesity than meat-eaters. Many surveys have shown that a balanced vegetarian diet is extremely healthy, and provides all protein, minerals and other nutrients that the body needs. In Yoga diet, usually protein is taken from the plant world, just as well as other herbivorous animals. In fact, nuts, spirulina, dairy products, and legumes all supply high-class protein. Meat is avoided in a Yoga diet because the meat eaters obtain the worst quality of protein from their food, a protein that is dead or dying. Animal protein contains too much uric acid to be broken down by the liver; some are

removed, but the rest is deposited in the joints, causing stiffness and eventually leading to severe problems such as arthritis.

The main principle of the Yoga diet is to increase the intake of fruits and vegetables with the aim of eventually shifting to a pure vegetarian diet. It is quite difficult for a person to begin Yoga diet all of a sudden. One may start to include plenty of green, leafy vegetables in diet while minimizing the intake of meat. If an individual is fond of certain unhealthy food, it is better to set a limit to consume those foods, like once a week. Regular intake of good protein food, such as nuts, legumes, whole grains, and cheese is very important. Consuming salad or raw vegetables every day is vital. If the individual is consuming cooked vegetables, it should be done as quickly as possible in order to preserve their goodness. While following Yoga diet, one should strictly cut back on junk food. It is best to avoid "denatured" food such as flour, white bread, cakes, or refined cereals; instead one can eat some fresh fruits every day.

1.9.3 BENEFITS OF YOGIC DIET

In time, one is sure to see the benefits of a Yoga diet. As much as the food in a Yoga diet is nutritious, it is also rich in Prana or life force. While there is a Yoga way of eating, there is also a Yoga way of not eating, referring to fasting. This is done by yogis as a form of physical cleansing or purification. Since we make our digestive system work several times a day, it is also required to give it some rest. This will allow our digestive system to recover from the abuses like eating too much, eating unhealthy foods or eating at the wrong time.

Fasting also allows us to get rid of toxins in our body. However, a careful approach must be taken while fasting. The other principles and benefits of Yogic diet are as follows:

1. Try to

- Eat only freshly prepared food, not more than three hours old
- Take cooked /heavy food/grains only twice per day
- Eat when you are hungry and stop before you are overfull
- After eating the stomach should be $\frac{1}{2}$ solid food, $\frac{1}{4}$ liquid & $\frac{1}{4}$ space
- Keep meal times routine – same every day
- Take 1 teaspoon of cow's ghee regularly
- Chew your food properly so it can be digested easily (32 times)
- Stimulate your appetite before meals with a little salt or ginger
- Swallow the mouthful you are working on before you take the next mouthful
- Eat slowly and Concentrate on your food
- Think of your food as the greatest energy from the earth and the universe, and in this sense, food is God for you

2. Avoid the following:

Don't drink too much before immediately after or during meals: This dilutes the digestive juices, thus 100 ml. is maximum

Don't combine milk with fruits

Don't eat when your stomach is upset/ when you are sick

Avoid processed, refined, frozen, deep-fried, or tinned food

Avoid bakery products, caffeine, soft drinks, spicy food, excess sugar or salt and GMO (genetically modified foods)

If you want to control your emotions and desires, avoid garlic and onions except when needed for health reasons

Avoid talking, reading or watching TV during meals

The ideal yogic diet can be summed up as the most natural and simplest to purchase, prepare and digest

3. Food to Eat

Fats and meats are harder to digest than lighter food such as carbohydrates. This is why a light, vegetarian meal gives more energy and does not create a feeling of fullness or heaviness.

Food is fuel for the digestive fire and there for must be pure, well combined and in correct quantity.

The amount of food one needs to eat depends on one's digestive power.

We must discover our own capacity and set ourselves a standard amount to eat at each meal. Few people however, can stop eating at the point of satisfaction, or a little short of it. Constantly eating beyond this point

puts out the digestive fire. Undigested food is worse than no food and becomes a detriment to our health. (Swami Shankardevananda, (2010) ,

4. Digestive Health

Eating with your hands is beneficial in that you can judge the temperature of your food before putting it in your mouth and it is believed that the energy in your fingertips has positive effects on your food!

Sitting cross-legged on the floor while you eat is said to enhance the energies of the abdomen by bringing them up from the legs

Sit on your knees with the sitting bones connected to the heels in Vajrasana (the thunderbolt pose) for 5-10 minutes after eating to aid digestion

Go for a short (100 steps), easy paced walk after sitting for a while (Elizabeth Beeds and Mrs. Pournima Mandlik, 2010)

1.10 EDUCATION

“Education” is the process of bringing about desirable changes in the behaviour of the child in terms of knowledge, skill, attitude, values and appreciation. For effective organisation of this process the teacher should be in touch with new trends in education and should try out new ideas of programmes and techniques experimentally making historical enquiry into their validity, utility and worth-while-ness under the school condition. The emphasis has to be

on qualitative improvement which obviously has not received adequate attention of the education.

Ever since the industrial revolution in science and its applications have helped to progress materially, human mind has worked wonders and has achieved a remarkable progress for the welfare of mankind. The last six decades in particular have witnessed a tremendous progress in science and technology. Researches in Electronics and recently in Bio-chemistry have solved many problems for which mankind found no solutions. All these were possible because science and scientific methods were introduced into education system in schools and colleges. We have produced enough food and other necessities that have made our present life free from hunger and diseases.

1.10.1 OBESE WOMEN ENGINEERING COLLEGE STUDENTS

All work and no play is making city students not only dull but fat. City teenagers going on 17 are carrying not only the heavy burden of parental expectations but extra kilos that they gain in their classrooms. Doctors in the city report that intermediate students are becoming more prone to lifestyle health problems gaining as much as 10 to 12 kgs over the two years they spend in the college. So students chase better grades, spending long hours cramming in cramped classrooms, and walk out much heavier after two years of backbreaking studies. The absence of playgrounds and large campuses, places for recreation and athletics for these students or even the scope to indulge in any extra curricular activity is only fuelling the obesity trend.

Both boys and girls of this age group face their own unique set of problems. Boys, as young as 17 or 18 are suffering from obesity and diabetes or even arthritis, while girls find themselves plagued by Poly-Cystic Ovarian Disease (PCOD). "Adolescent diabetes is on the rise. But what is alarming is the increase in the number of PCOD cases because of obesity. I see at least five to seven cases of PCOD among girls in their late teens, every month," said Dr Lalitha K, uro-gynaecologist, Yashoda Hospitals, adding that this trend has been on the rise in the last six to seven years. (Times of India, 2011)

"In college, all I wanted was to get an excellent rank and make it to a good engineering college and I only ended up being obese," said an IT professional, who studied in a private intermediate college in the city and is currently battling PCOD. "Intense competition in the most important years of their life makes them lead a blinkered existence as they exclude good fitness and health practice from their regimen," said Dr M V Rao from Apollo Hospital.

Far-from-ideal food habits are also another contributory factor. "These students may carry their lunch from home, but they binge on junk during their breaks. The high sodium, carbohydrates and cholesterol in this usually greasy fare adds to their weight gain, as it is coupled with a sedentary lifestyle without exercise," said Dr VSV Prasad, chief consultant paediatrician, Krishna Institute of Medical Sciences (KIMS). (Times of India, 2011)

But college authorities feel they cannot be blamed for the students' tendency towards obesity, and want to shoulder no responsibility for the students sitting down for 12-hour days. "I know students of this age who are affected by arthritis, but there is nothing we can do," says a source from a leading private college. And once the all-important board exams are over, slimming centres in the city see a spurt in students trying to shed that weight. "We get many 18-year-olds who have just completed their class 12. They then desperately want to get back in shape for college and look at slimming down drastically in just a couple of months," said Sahana, a trainer at La Belle slimming centre. (Times of India, 2011)

1.11 PHYSIOLOGY

Physiology is the science of functioning of all the organs and systems of an organism. For the physiological system of the body to be fit, they must function well enough to support to specific activity that the individual is performing more over different activity make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurologic process which are specific to the activity.

In physiology, one learn how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of human body functions. Exercise physiology is the study of how body's structures and functions are changed as a result of exercise. It applies the

concept of exercise physiology to training the athlete and enhancing the athlete's sports performance. (Ajmer Singh, 2005)

1.11.1 IMPORTANCE OF PHYSIOLOGICAL VARIABLES

Understanding the importance of physiology in physical education is to study the training effects, to study the ways and means by which the athletes can improve their performance and the principle of training methods. Sports consist of preparation and performance about 99% preparation and 1% performance. We need to make the most, effective use of our preparation time so that our athletes can achieve high level performance. For that the physiological systems should be taken care very much for the adaptation to their particular activities as because function decides structure. The system will change or adapt according to the nature of the activity. Therefore to know this fact among the players is very important for the improvement of performance. Because the level of fitness of physiological system may vary from players to player according to conditional status of the proper functioning of physiological system is needed to achieve in sports.

One of the main morphological differences between men and women is the greater amount of fat that women carry; this softens the outline of the muscles, more or less erases the osseous indicators, and rounds out the surfaces while creating characteristic folds and grooves. Fat in normal women represents between 18% and 20% of body weight, whereas in men it represents only 10% to 15%. The reason for this difference is that women at some point in their lives

may nourish a fetus and then a baby from their own reserves, so women have to stock energy in the form of fat in anticipation of future pregnancies (and must stock even more energy during the last two trimesters of pregnancy).

For various reasons, different fat distributions occur in women according to climate. In hot countries, the fat is localized on the buttocks, on the hips, and around the navel (certain Asians). This distribution avoids covering the woman with a hot coat of fat that would be difficult to bear and inefficient for thermoregulation during hot periods. In cold countries, the distribution of fat is more uniform, which provides for better protection during rigorous winters. However the fat is distributed, its main function is for the survival of the species as it provides for survival of the woman and her offspring during times of scarcity. It is important to note that all healthy people have fat reserves necessary for the proper functioning of their bodies. Obsession with obesity or the need to follow deviant aesthetic fashions should not lead to the complete elimination of fat. In fact, the almost complete disappearance of fat can lead to serious hormonal problems involving the cessation of the period (amenorrhea, which is a temporary absence of ovulation and therefore momentary sterility), as this means has been put in place during evolution to avoid bringing progeny into the world that the female could not nourish with her own organic reserves.

Thus, it was found that obesity plays vital role in limiting the functions of physiological system and in this research, whether, combined and isolated experiments of yogic practices and yogic diet influence physiological variables,

VO₂ max, vital capacity, Breath Holding time, Resting Pulse Rate and blood pressure can be favourably altered was studied.

1.12 PSYCHOLOGY

Psychology is an academic and applied discipline involving the scientific study of mental functions and behavior. Psychologists study such phenomena as perception, cognition, emotion, personality, behavior, and interpersonal relationships. Psychology also refers to the application of such knowledge to various spheres of human activity, including issues related to everyday life (e.g. family, education, and employment) and the treatment of mental health problems. Psychologists attempt to understand the role of these functions in individual and social behavior, while also exploring the underlying physiological and neurological processes. Psychology includes many sub-fields of study and applications concerned with such areas as human development, sports, health, industry, media, and law.

1.12.1 IMPORTANCE OF PSYCHOLOGY FOR MANAGING OBESITY

The obesity epidemic is not a product of changing genes or biology. It has its roots in the social environment and human behavior. Psychologists are experts at understanding human behavior as well as initiating and maintaining behavior change. Many psychologists have contributed to our understanding of obesity, its treatment and prevention, yet most psychologists are unaware of the obesity epidemic or view it as the domain of the medical establishment.

Expanding psychology's role in advancing health is one of the core elements of psychologists' strategic plan. To successfully address this goal, psychology must play a larger role in addressing the obesity epidemic, from basic science to prevention to treatment to public policy. This was a shocking development since Type-2 diabetes is a disease of overweight older adults. It soon became apparent that Type-2 diabetes in childhood was the consequence of the childhood obesity epidemic consuming our nation. It was found that 30 percent of children in our local school system entered kindergarten overweight or obese. These rates escalated to 41 percent of sixth graders, with African-American girls (43 percent) and Hispanic boys (46 percent) most affected. Type-2 diabetes in childhood is a travesty. The fact that 50 percent of African-American women are expected to get Type- 2 diabetes in their lifetimes is unacceptable. Type-2 diabetes is a preventable disease directly attributable to the obesity epidemic. Consequently, psychology can play in addressing the obesity epidemic as one of the initiatives. Psychological research and interventions are critical to addressing the obesity epidemic at all levels: The developing child, the family, the school and work environments, the physical environment, public policy, as well as advertising and the media. It is time for psychologists to care and to bring their skills, expertise and passion to bear on the most serious health challenge facing the nation. (Johnson SP, 2012)

Thus, it was found that efforts are underway to influence the obese women psychologically and through different means of exercising and dieting

programmes. In this study, the researcher was interested to make a study how far combined and isolated treatments of yogic practices and yogic diet influences the psychological variables, such as, self confidence, stress, self concept, achievement motivation and inter personal relationship could be improved favourably among obese women engineering college students were studied. obesity plays vital role in limiting the functions of physiological system and in this research, whether, combined and isolated experiments of yogic practices and yogic diet influence physiological variables, VO₂ max, vital capacity, Breath Holding time, Resting Pulse Rate and blood pressure can be favourably altered was studied.

1.13 REASONS FOR SELECTION OF TOPIC

Yogic exercises do give us enormous benefits for the wholesome physically fit and healthy men and women. All exercise burns calories for they involve movements and energy is required for every movement made. The calorie burning ability of each exercise depends on the speed and/or force at which the exercise is performed. The body needs energy for any kind of activity and the need is filled by burning off the foods that eat. Oxygen is the spark the fuel needs to burn regardless aerobics is the word in general use. The major benefits of different forms of exercises are stronger and more efficiently operating heart and lungs, more energy, physical flexibility, conditioned muscles, proper use of fats and effective burning of calories. The increased oxygen flow gained through aerobics re-energies by giving anyone more energy

and a “re-awakening” of his or her senses. The benefits of exercises and dieting regulations helps obese men and women in reduction of their fat which resulted in their improvement in the fitness, physiological, and psychological status.

In this study, the researcher was interested to find out the influence of combined and isolated yogic practices and yogic diet on selected physiological and psychological variables among obese engineering college women.

1.14 REASONS FOR SELECTION OF VARIABLES

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy. The primary treatment for obesity is dieting and physical exercise. Comparing with a normal healthy adult, an obese adult have lesser cardiac conditions, and increased body composition and blood pressure and psychological let up by self and surroundings. Researches proved that yogic practices burn out fat, altered physiological variables favourably and improved psychological conditions. Researches have also proved that yogic diet has contributed for managing obesity. However, the influence of combined and isolated effects of yogic practices and yogic dieting were not reported. Since physiological variables VO_2 max, Breath Holding time, Resting Pulse Rate, Vital Capacity and Blood pressure are directly influenced by obesity, these physiological variables were selected for this study. There are number of researches to prove that obese men and women lack adequate psychological requirements to face the life confidently. Thus, obese women suffers lack of self

confidence, self concept, achievement motivation, inter personal relationship, and increases stress, these variables were selected for this study.

1.15. STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of combined and isolated yogic practices and yogic diet on selected physiological and psychological variables among obese engineering college women students.

1.16 HYPOTHESES

1. It was hypothesized that the selected isolated yogic practices would significantly alter selected physiological variables, VO₂ max, Breath Holding time, Resting Pulse Rate, Vital Capacity and Blood pressure and psychological variables, Self Confidence, Stress management Inter Personal Relationship, Achievement Motivation and Self Concept of obese engineering college women students.
2. It was hypothesized that the selected isolated yogic diet would significantly alter selected physiological variables, VO₂ max, Breath Holding time, Resting Pulse Rate, Vital Capacity and Blood pressure and psychological variables, Self Confidence, Stress management Inter Personal Relationship, Achievement Motivation and Self Concept of obese engineering college women students.

3. It was hypothesized that the selected combined yogic practices and yogic diet would significantly alter selected physiological variables, VO₂ max, Breath Holding time, Resting Pulse Rate, Vital Capacity and Blood pressure and psychological variables, Self Confidence, Stress management Inter Personal Relationship, Achievement Motivation and Self Concept of obese engineering college women students.
4. It was hypothesized that comparing between the treatment groups, the combined group experimented with yogic practices and yogic diet would be significantly better than isolated treatments, yogic practices and yogic diet in altering selected physiological and psychological variables.

1.17 SIGNIFICANCE OF THE STUDY

An escalating epidemic of overweight and obesity is affecting many countries in the World, and if action is not taken now to stem the pandemic, millions of people will develop non communicable diseases and other health disorders. Obesity is now well recognized as a disease in its own right, one which is largely preventable through changes in life style. This fact, together with its association with the leading causes of illness and death, has made obesity a high priority problem in the World. Without effective intervention like yogic practices and yogic diet which are easy to practice and adopt by women

changes could not be attributed. In the light of the above observations, the following significances were outlined for this study.

1. The present study would acquaint with the physiological and psychological status of obese engineering college women students.

2. It would facilitate the teachers and fitness trainers in providing appropriate training to know the benefits of yoga practices, yogic diet and combined treatment of yoga practices and yogic diet for managing obesity among obese women college students.

3. It would facilitate the in providing appropriate training to know whether selected yoga asanas and yogic diet have any relationship with the selected physiological variables, VO_2 max, breath holding time, resting pulse rate, vital capacity and blood pressure among obese women engineering college students.

4. It would facilitate the in providing appropriate training to know whether selected yoga asanas and yogic diet have any relationship with the selected psychological variables, Self Confidence, Stress management Inter Personal Relationship, Achievement Motivation and Self Concept among obese women engineering college students.

4. The results of the study would add further knowledge to the existing literature of physical education and yoga.

5. The findings of the study would provide a guideline to the future research investigators in physical education and yoga to conduct further research in this field.

6. The findings of this study would suggest suitable yogic practices and yogic diet for physiological and psychological preparations.

1.18 DELIMITATIONS

The following delimitations were recorded for this study.

1. Eighty obese women studying in different engineering colleges in Chennai were selected for this study.
2. Obesity of the subjects was determined based on the body mass index of the subjects. The subjects who were having more than Body Mass Index of 30 kg/m^2 , considered as obese for the purpose of this study.
3. The subjects selected for this study were in the age group of 20 – 25 years.
4. The subjects were divided into four groups. Each group consisting of fifteen each, namely, experimental group I (Yogic Practices Group), experimental group II (Yogic Diet Group), experimental group III (Combined Group) and control group.

5. Only the following dependent and independent variables were selected for this study.

Physiological variables

- a. VO₂ max
- b. Resting Pulse Rate
- c. Breath Holding Time
- d. Vital Capacity
- e. Mean Arterial Blood Pressure

Psychological Variables

- a. Self confidence
- b. Stress Management
- c. Inter personal relationship
- d. Achievement Motivation
- e. Self Concept

1.19 LIMITATIONS

The study was limited in the following ways, which would be taken into consideration at the time of findings of this study.

1. The investigator has not taken into consideration of the past experiences of the subjects in exercising.

2. The climatic conditions, diet and other daily routines of the subjects were not controlled.
3. The economical and social background of the obese students was not taken into consideration.

1.20 DEFINITION OF TERMS USED

The following terms used in this study were defined.

1.20.1 Yoga

Yoga is the science of man and is therefore, entirely concerned with the application of its technology in daily life.

Yoga is as old as India itself. It was recorded in Vedas "Yug" to mean to join or to yoke. Yoke was the basic symbol of India at that time and it to be so. Yoking the oxen is a primitive deed of Harappa pre historic civilization of India. (Sharma, et al. 2012).

1.20.2 Asanas

Asanas means posture. It is derived from the Sanskrit root "as" which means "to sit". (Sharma, et al. 2012).

1.20.3 Yogic Diet

Yogic diet is the food that promotes clarity and calmness of mind and is favourable for spiritual growth. It is "sweet, fresh and agreeable" and includes most fruits, nuts, seeds, vegetables, particularly green leafy vegetables, whole grains, honey, pure water and milk that promotes life style virtue, strength,

health, happiness, purification of inner being and it also provides more benefit to cure hypertension. (Mouze, 2010)

1.20.4 Physiology

Physiology is the study about the function of the body. (Astrand, 1977)

1.20.5 VO₂ Max

VO₂ max is the maximal oxygen uptake or the maximum volume of oxygen that can be utilized in one minute during maximal or exhaustive exercise. It is measured as milliliters of oxygen used in one minute per kilogram of body weight. (Strukic, P.J, 1981)

1.20.6 Breath Holding Time

Breath holding time is define as the duration of time through which one can hold his breath without the study of all living things. (Laurence E. Morehouse and Augustus T.Miller, 1967).

1.20.7 Resting Pulse Rate

The time from the end of one contraction to the end of the next contraction is a complete heart beat or pulse or cardiac cycle. The complete cardiac cycle takes less than one second (about 0.08 sec) in a normal adult at rest and it shortened by exercise. (Astrand, 1977).

1.20.8 Vital Capacity

The volume of air that can be moved out of the lungs after maximum inspiration is called vital capacity. (Morehouse and Miller, 1967)

1.20.9 Mean Arterial Pressure

It is defined as the average arterial pressure during a single cardiac cycle.

As blood is pumped out of the left ventricle into the arteries, pressure is generated. The mean arterial pressure (MAP) is determined by the cardiac output, systematic vascular resistance and central venous pressure according to the following relationship, which is based upon the relationship between flow, pressure and resistance. (Edward and Mathews, 1981)

1.20.10 Systolic Blood Pressure

As blood is ejected into the aorta and other arteries during ventricular systole, the pressure increased to a maximum called systolic blood pressure. (Strukic, P.J, 1981)

1.20.11 Diastolic Blood Pressure

As blood drains from the arteries during ventricular diastole the pressure decreases to a minimum called diastolic blood pressure. (Strukic, P.J, 1981)

1.20.12 Psychology

Psychology is the science of the activities of an individual in relation to his environment. (Albert V.Carvon, 1980) .

1.20.13 Self confidence

A person's belief that he or she can succeed. Self-confidence is usually specific to particular tasks, but some people seem to display it in a wide range of activities. In sport, it has long been thought of as an important determinant of performance. It tends to be self-generating: confident athletes set themselves difficult training goals and persevere until they have achieved them. (Albert V.Carvon, 1980)

1.20.14 Stress

Stress is defined as a feeling of emotional or physical tension. Emotional stress usually occurs when situations are considered difficult or unmanageable. Therefore, different people consider different situations as stressful. (Kamlesh, 1993)

1.20.15 Inter personal relationship

An interpersonal relationship is a relatively long-term association between two or more people. (Alderman, R.B. 1974)

1.20.16 Achievement Motivation

Achievement motivation refers to the tendency to strive to achieve and excel in whatever challenge that is presented. (Kamlesh, 1990)

1.20.17 Self Concept

Self-concept as the totality of attitude judgment and values of an individual relating to his behavior, ability and qualities, self-concept embraces the awareness of these variable and their calculation. (Alagaonkar,J. 1997)