

CHAPTER - I

INTRODUCTION

1.1 YOGA

Yoga is an ancient Indian practice that aims at rehabilitating and reinforcing a balance between the body, mind, and spirit. Used as a complementary practice alongside allopathic treatment, it can help individual's cope and live with muscular dystrophy. Incorporating Static and Dynamics of yoga practices can help ease the conditions of muscular dystrophy and greatly improve the quality of life. Muscular dystrophy yoga uses a series of gentle and easy movements in combination with deep breathing techniques to improve muscle tone and reduce pain. (Werner, 1999)

1.2 ORIGIN OF YOGA

Yoga the very word radiates peace and tranquility. The word Yoga is derived from the Sanskrit word 'Yuj' which essentially means to join or unite. The union referred to is that of the individual self-uniting with Cosmic Consciousness or the Universal Spirit. Yoga is a means to achieving this goal. Born in India, almost 26,000 years ago, Yoga is believed to have evolved during the period of the 'Sat Yuga', also called the Golden age. This period became known as a time of everlasting peace and abundant blessings, filled with seekers of the Eternal Truth. It was not until the discovery of the Indus- valley civilization, the largest civilization that knowledge about the origin of Yoga surfaced. Excavations give evidence of yoga's existence during this period; yogi -like figures engraved on soapstone seals have been unearthed. In fact, it was the Aryans, migrating from the north- west, who were instrumental in discovering yoga. The purpose of yoga (meaning to bind) was called the 'raising of Mother Kundalini (the life force at the base of the spine). Yoga had its origins in India in the Sat Yuga, the Age of Gold, over 26,000 years ago. This was a long peaceful age of abundance in which humans had plenty of time to search within. The yoga of the raising of the Kundalini at this time blossomed organically, out of the intuition and spontaneity of the practitioner. The goal of the yogi was to ascend into the immortal realms of pure spirit, to imbibe the intuitional nectar of enlightenment, eradicate disease

and find liberation from suffering. This was called Samadhi. In 600 B.C., during the dark age of Kali Yuga, signified by Iron, these practices were written down for the first time by Patanjali in India and thus gained a structure that evolved into various systems given out by contemporary Gurus. This structure was called the Eight Limbs of Patanjali's Yoga.

Ultimately, the students of yoga were to gain enough systematic knowledge of yoga techniques that they could tap into the original or primal yoga of spontaneity, intuition, and creative freedom, a condition that modern yogic practitioners might refer to as Super-mind. The seed mantra of yoga is AUM or OM. It is the sound of the Cosmos and is the sound that constitutes the Akashic Realms (the non-material ethylic plane), the source of Samadhi. This universal tone of pure resonance is produced elegantly by the disc-shaped instrument called the Ancient Gong. OM is the combined resonant tone of Life Force that fills the Infinite Living Universe. OM is that tone impinging on Matter, creating the physical Universe which resonates like a gong from atom to galaxy. A Gong is a cosmic engine of power and is appropriately named after the sound that it makes. It is an instrument that releases this all powerful OM resonance which, although constituting all materiality, is not limited to finite manifestation. It produces Holistic Tones which have 'fullness' and to which the whole being responds. By playing our body, mind and emotions as an organic gong, we are led to the OM power of our Greater Self.

One of the beauties of the physical practice of yoga is that the poses support and sustain us no matter how old or young. As our age, our understanding of asana becomes more sophisticated. One moves from working on the external alignment and mechanics of the pose to refining the inner actions to finally just being in the asana. Yoga has never been alien to us. We have been doing it since we were a baby. Whether it is the Cat Stretch that strengthens the spine or the Wind-Relieving pose that boosts digestion, you will always find infants doing some form of yoga throughout the day. Yoga can be many things to many people. We are determined to help to discover our "Yoga Way of Life!" The ultimate goal of Yoga is moksha (liberation), though the exact definition of what form this takes depends on the philosophical or theological system with which it is conjugated.

1.3 SURYA NAMASKAR

Surya Namaskara also known in English as Sun Salutation is a common sequence of asanas. Its origins lie in India where its large Hindu population worships Surya, the Hindu solar deity. This sequence of movements and asanas can be practiced on varying levels of awareness, ranging from that of physical exercise in various styles, to a complete sadhana which incorporates asana, pranayama, mantra and chakra meditation. It is often the beginning vinyasa within a longer yoga series. Sūrya Namaskara may also refer to other styles of "Salutations to the Sun". The Sun Salutation is regularly practiced in many Indian schools. The Hatha Yoga Pradipika, the oldest known hatha yoga text does not mention "Sun Salutations" but mentions a sūrya-bhedana (sun-piercing) kumbhaka (II, 44 and 48-50) while the Gheraṇḍa Saṁhitā mentions sūrya-bheda kumbhaka (58-59). The oldest documented book with clear depictions of asanas is the Sritattvanidhi, though there is no mention of "Sun Salutations" in the text, it does describe the asanas "Sarpasana" (Bhujangasana), "Gajasana" (Adhomukh Swannasan), "Uttanasana" and series of asanas done in tandem, similar to Sūrya Namaskāra

Surya Namaskara, like most asanas, is recommended to be performed on an empty stomach. Therefore some recommend a gap of at least two hours after eating and before performing the namaskara. It is generally practiced in the morning before breakfast or in evening. Shavasana is practiced at the end of practice for rest. Pranayama is synchronized with asanas. Mantras can be pronounced at the start of each Surya namaskara. Bījas(seeds) or the 12 mantras specific to each asana can also be chanted while performing each asana. The 12 specific mantras, though, repeated mentally instead. Chakras are points-of-focus, when performing asanas. There are a total of 8 different asanas in the sequence of the 12 asana changes of Surya namaskara. Some asanas are repeated twice in the same cycle of a Surya Namaskara. In a traditional Hindu context, Surya Namaskara is performed facing in the direction of the rising (east) or setting (west) sun. According to the scriptures one who performs the Surya Namaskaras daily does not get poor in a thousand births. There are 5 ways in which breathing should be done during Surya Namaskar.

Step	Asana	Breath	Chakra	Position
1	Pranamasana	Exhale	Anahata	Heart
2	Hasta Uttanasana	Inhale	Vishuddhi	Throat
3	Hastapaadasana	Exhale	Swadhisthana	Sacrum
4	Aekpaadprasarnaasana (one foot back, lift head, hands often on earth)	Inhale	Ajna	Third eye
5	Adho Mukha Svanasana /parvatasana	Exhale	Vishuddhi	Throat
6	Ashtanga Namaskara	Suspend	Manipura	Solar plexus
7	Bhujangasana	Inhale	Swadhisthana	Sacrum
8	Adho Mukha Svanasana	Exhale	Vishuddhi	Throat
9	Ashwa Sanchalanasana(opposite foot forward from 4, hands often on earth)	Inhale	Ajna	Third eye
10	Uttanasana	Exhale	Swadhisthana	Sacrum
11	Hasta Uttanasana	Inhale	Vishuddhi	Throat
12	Pranamasana	Exhale	Anahata	Heart

1.4 HATHA YOGA

The earliest references to hatha yoga are in Buddhist works dating from the eighth century. The earliest definition of hatha yoga is found in the 11th century Buddhist text Vimalaprabha, which defines it in relation to the center channel, bindu etcetera. The basic tenets of Hatha yoga were formulated by Shaiva ascetics Matsyendranath and Gorakshanath c. 900 CE. Hatha yoga synthesizes elements of Patanjali's Yoga Sutras with posture and breathing exercises. Hatha yoga, sometimes referred to as the "psychophysical yoga", was further elaborated by Yogi Swatmarama,

compiler of the Hatha Yoga Pradipika in 15th century. This yoga differs substantially from the Raja yoga of Patanjali in that it focuses on shatkarma, the purification of the physical body as leading to the purification of the mind (ha), and prana, or vital energy (tha). Compared to the seated asana, or sitting meditation posture, of Patanjali's Raja yoga, it marks the development of asanas (plural) into the full body 'postures' now in popular usage and, along with its many modern variations, is the style that many people associate with the word yoga today. It is similar to a diving board preparing the body for purification, so that it may be ready to receive higher techniques of meditation. The word "Hatha" comes from "Ha" which means Sun, and "Tha" which means Moon **(Mallinson. J, 2011)**

Hatha yoga, also called hatha vidyā, is a kind of yoga focusing on physical and mental strength building exercises and postures described primarily in three texts of Hinduism:

1. Hatha Yoga Pradipika, Svātmārāma (15th century)
2. Shiva Samhita, author unknown (1500 or late 17th century)
3. Gheranda Samhita by Gheranda (late 17th century)

Many scholars also include the preceding Goraksha Samhita authored by Gorakshanath of the 11th century in the above list. Gorakshanath is widely considered to have been responsible for popularizing hatha yoga as we know it today. Vajrayana Buddhism, founded by the Indian Mahasiddhas, has a series of asanas and pranayamas, such as tummo (Sanskrit *caṇḍālī*) and trul khor which parallel hatha yoga.

The main objective of Hatha Yoga is to promote balance between physical (pingala nadi) and mental-emotional energy (ida nadi). One of the leading authorities in Hatha Yoga, Swami Swatmarama, wrote the "Hatha Yoga Pradipika" (Light on Yoga) in Sanskrit. "Asana is spoken of as the first part of Hatha Yoga. It should be practiced for gaining steadiness of the body and mind, freedom from disease and lightness of the body." (Hatha Yoga Pradipika 1:17). Out of several thousands of asanas that originally existed, only around one hundred of the most prevalent are taught today. Out of those, some are dynamic and others static.

1.4.1 Dynamic Asanas

Dynamic Asanas involve active movement of the body. They affect the skeletal and muscular system and are aimed at developing flexibility. They stretch and tone the muscles, increase the flexibility of the joints and release energy blockages. They improve the function of the digestive and excretory systems, strengthen the lungs, remove stagnant blood from various parts of the body, and improve circulation. Dynamic asanas are particularly useful for beginners **(Gilbert NG, 2009)**.

1.4.2 Static Asanas

Static asanas involve holding a pose for several minutes, and encourage deep, rhythmic breathing. These asanas affect the physical, pranic (vital energy) and mental aspects of being. They gently massage the internal organs and glands, which in turn regulates the release of hormones, and invigorates and relaxes the nervous system. They bring inner peace and prepare the practitioner for more advanced yoga practices, such as meditation. Static asanas are more suitable **(Gilbert NG, 2009)**.

1.5 PUBERTY

Puberty refers to the transition in life from being a girl into becoming a woman. It marks the inception of sexual maturity and a body which is capable of reproduction, marked by changes like breast development and menstruation. Girls attain reproductive maturity four years after the first physical changes of puberty appear. Between the ages of 10 and 14 most boys and girls begin to notice changes taking place in their bodies. These changes, which occur over a number of years, are generally referred to as puberty. The changes take place in all boys and girls but they will start at different times and take place at different rates. Not everyone starts puberty between the ages of 10 and 14, some people start younger, and some much later. Similarly, in some people all the changes take place in two years, and in others they can take as long as four years. Generally they start between ages 7 and 13 in girls and ages 9 and 15 in boys **(Kail, RV and Cavanaugh JC, 2010)**.

Puberty starts when extra amounts of chemicals called hormones start to be produced in the body. These hormones guide the changes that take place in the body. As well as causing physical changes these hormones also cause emotional changes. Puberty starts when extra amounts of chemicals called hormones are produced in the

body. In girls, a hormone called estrogen guides the changes that take place in the body. Puberty is the process of physical changes through which a child's body matures into an adult body capable of sexual reproduction to enable fertilization. It is initiated by hormonal signals from the brain to the gonads: the ovaries in a girl, the testes in a boy. In response to the signals, the gonads produce hormones that stimulate libido and the growth, function, and transformation of the brain, bones, muscle, blood, skin, hair, breasts, and sex organs. Physical growth height and weight accelerates in the first half of puberty and is completed when the child has developed an adult body. Until the maturation of their reproductive capabilities, the pre-pubertal physical differences between boys and girls are the external sex organs.

On average, girls begin puberty at ages 10–11; boys at ages 11–12. Girls usually complete puberty by ages 15–17, while boys usually complete puberty by ages 16–17. The major landmark of puberty for females is menarche, the onset of menstruation, which occurs on average between ages 12–13; for males, it is the first ejaculation, which occurs on average at age 13. In the 21st century, the average age at which children, especially girls, reach puberty is lower compared to the 19th century, when it was 15 for girls and 16 for boys. This can be due to any number of factors, including improved nutrition resulting in rapid body growth, increased weight and fat deposition, or exposure to endocrine disruptors such as xenoestrogens, which can at times be due to food consumption or other environmental factors. Puberty which starts earlier than usual is known as precocious puberty. Puberty which starts later than usual is known as delayed puberty.

Notable among the morphologic changes in size, shape, composition, and functioning of the pubertal body, is the development of secondary sex characteristics, the "filling in" of the child's body; from girl to woman, from boy to man. Derived from the Latin *puberatum* (age of maturity), the word puberty describes the physical changes to sexual maturation, not the psychosocial and cultural maturation denoted by the term adolescent development in Western culture, wherein adolescence is the period of mental transition from childhood to adulthood, which overlaps much of the body's period of puberty.

1.5.1 Pubertal Development

Adolescence is one of the most fascinating and complex transitions in the life span. Its breathtaking pace of growth and change is second only to that of infancy. Biological processes drive many aspects of this growth and development, with the onset of puberty marking the passage from childhood to adolescence. Puberty is a transitional period between childhood and adulthood, during which a growth spurt occurs, secondary sexual characteristics appear, fertility is achieved, and profound psychological changes take place. Although the sequence of pubertal changes is relatively predictable, their timing is extremely variable. The normal range of onset is ages 8 to 14 in females and ages 9 to 15 in males, with girls generally experiencing physiological growth characteristic of the onset of puberty two years before boys. Pubertal maturation is controlled largely by complex interactions among the brain, the pituitary gland, and the gonads, which in turn interact with environment (i.e., the social, cultural, and ambient environment). A relatively new area of research related to puberty is that of brain development. Evidence now suggests that brain growth continues into adolescence, including the proliferation of the support cells, which nourish the neurons, and myelination, which permits faster neural processing. These changes in the brain are likely to stimulate cognitive growth and development, including the capacity for abstract reasoning.

1.5.2 Changes in Girls During Puberty

Puberty can be a confusing time for preteen and teen girls. Learn about all the changes in girls during puberty from breast growth, to pubic hair, to self-esteem, peer pressure, acne and much more.

1.5.2.1 Hormones

Hormones play a key role in development during puberty. Learn how they work to bring about specific changes during the teen years.

1.5.2.2 Growth Spurt

Female Growth Spurt is an exciting event that happens during puberty. Learn how why it happens and what you can expect when it does.

1.5.2.3 Teen Acne

Teen acne can be an unpredictable and frustrating part of puberty. Learn all about acne and how to treat it.

1.5.2.4 Menstruation

Menstruation is the shedding of the wall of the uterus and starts at puberty. Get all the questions answered by a trusted friend and expert on female puberty.

1.5.2.5 Puberty Hair

Puberty hair refers to extra hair you develop on your body once your hormones signal the start of female puberty. The main areas that you will grow extra hair are on your vagina.

1.5.2.6 Irregular Menstrual Cycle

Having an Irregular Menstrual Cycle is common during female puberty. In some cases it may be caused by an underlying hormone imbalance or other medical problem. Educate yourself on what is normal

1.5.2.7 The Developmental Impact of Puberty

The biological changes associated with puberty are of special significance both to the young people themselves and to their community, but the ways these changes are interpreted and portrayed varies with cultural circumstances. Rites of Passage- In many societies, the transition to adolescence are recognized by ritual. These ceremonies are often public events that herald the contributions to society the young person is expected to make in his/her adult life. In some culture it has been found by the anthropologist, Margaret Mead, that girl's first menstruation is accompanied by spiritual rites that symbolized her emergence as a woman ready to become a productive member of the community.

1.5.2.8 Psychological responses to pubertal events

The events of puberty are rarely talked about publicly by the individuals who are experiencing them or by their community. Until fairly recently, when people recalled menarche or their first ejaculations it was often in negative or comic terms.

Both boys and girls are initially secretive about the onset of nocturnal emissions and menarche. In a study it has been found that girls' attitudes and beliefs about menstruation are only in part a result of their direct experience. In fact a girl's physical symptoms during menstruation are often correlated with the expectations she had before menarche. Girls who reported unpleasant symptoms were more likely to have been unprepared for menarche, to mature early and to be told about menstruation by someone they perceived negatively. Similarly the responses of boys to their first ejaculations depend on the context in which it occurs.

Physical changes that occur during puberty are usually marked by distinct stages of development known as Tanner stages. These were named after the child development expert, James Mourilyan Tanner, who first identified them. The Tanner stages give average dates of development, although there can be significant variation among children and teenagers. You should not worry if you reach a stage of puberty before or after your friends do.

1.5.2.9 Causes of Puberty

The onset of puberty is normally triggered by the hypothalamus which signals the pituitary gland to release hormones that stimulate the ovaries (in girls) or testicles (in boys) to secrete sex hormones. The hypothalamus and pituitary are small glands near the brain that secrete hormones. Although in most instances no cause is found for the condition but in some cases the following causes may be responsible for early onset of puberty:

Structural changes in the brain for example tumor, Brain injury, Infection, Disorders of the ovaries or testicles, Problems of the thyroid gland, Congenital adrenal hyperplasia, Hypothalamic hamartoma, McCune-Albright syndrome, Tumors that release a hormone called HCG.

1.5.2.10 Symptoms

Precocious puberty is if the following symptoms are seen in girls before the age of 8 years such as enlargement of penis and testicles, Development of underarm or pubic hair, Rapid growth in the height, Breast development, Onset of menstruation (menarche), Acne, and Maturation of outer genitals (**Illing. N, 1997**).

1.5.2.11 Clinical and social significance

Medical evaluation is sometimes necessary to recognize the few children with serious conditions from the majority who have entered puberty early but are still medically normal. Early sexual development warrants evaluation because it may:

1. Induce early bone maturation and reduce eventual adult height
2. Indicate the presence of a tumor or other serious problem Cause the child, particularly a girl, to become an object of adult sexual interest. Early puberty is believed to put girls at higher risk of sexual abuse, unrelated to pedophilia because the child has developed secondary sex characteristics.
3. Early puberty also puts girls at a higher risk for teasing or bullying, mental health disorders and short stature as adults.

Helping children control their weight is suggested to help delay puberty. Early puberty additionally puts girls at a "far greater" risk for breast cancer later in life. Girls as young as 8 are increasingly starting to menstruate, develop breasts and grow pubic and underarm hair; these "biological milestones" typically occurred only at 13 or older in decades past. Females of African ancestry are especially prone to early puberty. There are theories debating the trend of early puberty, but the exact causes are not known.

1.5.2.12 Diagnosing Early Puberty

There are two kinds of early puberty. The more common form is central precocious puberty. This is when the brain starts the normal process of puberty triggering the release of various hormones but does it early. In most cases, there is no known reason. Very rarely, central precocious puberty has a medical cause, like an infection or growth in the brain. Peripheral precocious puberty is less common. It usually develops when a problem with the ovaries or testicles like a cyst or a tumor triggers the release of the hormones estrogen or testosterone. To diagnose early puberty, your child's doctor will ask some questions and run some tests. They might include:

1. A physical exam, to evaluate any changes in the body.

2. A family history, to find out if early puberty might run in the family.
3. Blood tests, which check a child's hormone and sometimes thyroid levels.
4. X-rays, usually of the hand and wrist, to check a child's bone age. This is a way of seeing how quickly he or she is growing.
5. MRIs of the brain. These are sometimes used to rule out medical problems that could cause central precocious puberty, like tumors. MRIs are not routine for most kids. They're used when an underlying cause is more likely, as in children under 6 or kids with other symptoms.
6. Ultrasounds -- of the ovaries, for instance -- can be helpful in some cases.

1.5.2.13 Socio environmental

Social environmental is a term used to describe the general conduct exhibited by individuals within a society. It is essentially in response to what is deemed acceptable by a person's peer group or involves avoiding behavior that is characterized as unacceptable. This type of human behavior primarily determines how individuals interact with one another within a group or society. While social conduct is often modeled to create a comfortable social environment, anti-social behavior, such as aggression, scapegoating and group bullying, may also be defined as negative social behavior, particularly in instances where other individuals within a peer group all behave accordingly. Just as positive interactions among individuals in a society help create a pleasant environment for citizens, activities defined by peer groups to be acceptable, even if harmful to select individuals or subgroups within a society, are also part of social behavior. Studies of massive human violations have helped illustrate the extent by which harmful, but socially acceptable, behaviors have persisted in some societies. Examples of widespread acceptance of negative behavior within a peer group include historical incidents of mass genocide and human enslavement. With the use of specially designed behavior therapies and programs, doctors, educators and others can help individuals who are suffering from social disorders, such as shyness or unrestrained anger, learn how to overcome these issues to become more productive members of society. Not only is the study of how social conduct affects members of mainstream society important, but in studying anti-social behavior, in particular, mental health professionals are able to help people isolated from society become rehabilitated

and engage in positive interactions with others. Even when considering the prevalence of the dual inheritance theory, which attributes human behavior to a combination of genetic selection and cultural influence, social conduct programs may have a positive impact in correcting socially maladaptive behaviors in individual patients. Research within sociology and psychology have questioned whether traits, such as altruism, may be genetically influenced while, at the same time, be rooted in social psychology

Through the study of social psychology, it is known that humans are not the only beings influenced by social groups. Researchers studying animals and insects have found that social behavior governs the activities of these groups, as well. This is particularly evident in animals and insects that live their entire lives within a group of the same species and where each member has a role to play in that group's survival. As illustrated by the following examples of research findings, health outcomes are linked to multiple environmental factors.

1.5.2.14 Family

Adolescents who perceive that they have good communication and are bonded with an adult are less likely to engage in risky behaviors. Parents who provide supervision and are involved with their adolescents' activities are promoting a safe environment in which to explore opportunities. The children of families living in poverty are more likely to have health conditions and poorer health status, as well as less access to and utilization of health care.

1.5.2.15 School

Academic success and achievement are strong predictors of overall adult health outcomes. Proficient academic skills are associated with lower rates of risky behaviors and higher rates of healthy behaviors. High school graduation leads to lower rates of health problems and risk for incarceration, as well as enhanced financial stability during adulthood. The school social environment affects students' attendance, academic achievement, and behavior. A safe and healthy school environment promotes student engagement and protects against risky behaviors and dropping out.

1.5.2.16 Neighborhoods

Adolescents growing up in distressed neighborhoods characterized by concentrated poverty are at risk for a variety of negative outcomes, including poor physical and mental health, delinquency, and risky sexual behavior.

1.5.2.17 Media Exposure

Adolescents who are exposed to media portrayals of violence, sexual content, smoking, and drinking are at risk for adopting these behaviors.

1.6 BENEFITS OF YOGA FOR PRETEEN GIRLS

1.6.1 Get Strong

Yoga will tone the entire body. The postures work to strengthen the arms, the legs, the spine and the abdomen. Pre-teen girls will also see improvement in the sports they play, they will feel less pain lugging around a backpack full of books and they will totally be able to beat their brother up.

1.6.2 Get Flexible

Yoga will stretch out their entire body. It will lengthen their hamstrings, help release a tight lower back, and stretch out their hips. This makes sitting in their desk all day way more comfortable, it will help to stretch their out after an intense soccer game and will improve their posture.

1.6.3 Improves Sleep

Yoga helps to balance out their body and mind. Over time they will see that they sleep better; it is easier to fall asleep, stay asleep and wake up refreshed. Yoga helps to relax their body and mind which does miracles for stress and anxiety.

1.6.4 Healthier Eating

Yoga will change the way they look at food. They'll learn to really honour their body. They will want to put healthy, fresh, life giving food into their body versus sugary processed crap. After a great yoga practice they'll crave a fresh fruit and veggie's.

1.6.5 Clarity of Mind

We have thousands of thoughts per day and sometimes those thoughts get really negative. It is hard to know what feels right when their head won't shut up! Yoga gives them peace, it clears all the mental fog away and they will experience space and ease in their mind.

1.6.6 Respect for Your Body

This is a mega huge benefit of yoga especially for teen girls. Yoga teaches us to love our bodies. They will learn to really appreciate the body they have and all it can do for them. It creates confidence and builds self esteem through creating a strong relationship with their body.

1.6.7 Improves Mental Focus

Yoga teaches us about breathing deeply, quieting the mind and becoming present. Try taking 10 deep breaths with their eyes closed before a major test. When we tune into our breath and oxygenate our brain cells, we find quiet inside ourselves and deep focus and clarity ensues. It does wonders for the way we listen, think and act.

1.6.8 Opens their Heart

Yoga teaches us we are all one. Yoga reveals to us the beauty and vastness of our hearts. We learn compassion, self love, and how to listen to our innate wisdom. We see people differently when we connect with our hearts. We are kinder to ourselves and others.

1.6.9 Helps them out in an Emotional Time

Their yoga mat will hold their secrets, their tears, and their pain. Nobody can tell them how many times they have cried in a yoga class. The movement of the body and breath, the messages of the heart, the ritual of it all will provide them with strength and security. When they are going through a hard time, turn to their yoga practice for guidance.

1.6.10 Creates Community

Coming to a yoga class with other girls will show them that there are other girls just like them Teen girls that want to learn yoga, that wants to discover more about themselves. Girls that know what it's like to be insecure, shy, or are going through a rough time. It is the best thing ever when we can connect to likeminded people and support one another! One can tell them that their Yoga Girlfriends always accept me and love me just as they are. They don't judge me or knock me down. They can share with them their real and true self.

1.7 SEDENTARY BEHAVIOR

Sedentary behavior refers to any waking activity characterized by energy expenditure ≤ 1.5 metabolic equivalents and a sitting or reclining posture. In general this means that any time a person is sitting or lying down, they are engaging in sedentary behavior. Common sedentary behaviors include TV viewing, video game playing, computer use (collective termed "screen time"), driving automobiles, and reading (**Sedentary Behavior Research Network, 2012**).

Sedentary Behavior Research Network 2012: Standardized use of the terms "sedentary" and "sedentary behaviors". Recent evidence suggests that having a high level of sedentary behavior negatively impacts health independent of other factors including body weight, diet, and physical activity. For example, a 12-year study of 17,000 Canadian adults found that those who spent most of their time sitting were 50% more likely to die during the follow-up than those that sit the least, even after controlling for age, smoking, and physical activity levels. Given these and other findings, researchers are now studying the health impact of sedentary behavior in a wide range of academic domains including epidemiology, population health, psychology, ergonomics, engineering, and physiology.

1.8 PHYSICAL ACTIVITY

Physical activity is any body movement that works your muscles and requires more energy than resting. Walking, running, dancing, swimming, yoga, and gardening are a few examples of physical activity. According to the Department of Health and Human Services' "2008 Physical Activity Guidelines for Americans," physical activity generally refers to movement that enhances health. Exercise is a type of physical

activity that's planned and structured. Lifting weights, taking an aerobics class, and playing on a sports team are examples of exercise (**WHO, 2000**).

Physical activity is good for many parts of your body. This article focuses on the benefits of physical activity for your heart and lungs. The article also provides tips for getting started and staying active, and it discusses physical activity as part of a heart healthy lifestyle. Being physically active is one of the best ways to keep your heart and lungs healthy. Following a healthy diet and not smoking are other important ways to keep your heart and lungs healthy. Many Americans are not active enough. The good news, though, is that even modest amounts of physical activity are good for your health. The more active you are, the more you will benefit.

1.8.1 Types of Physical Activity

The four main types of physical activity are aerobic, muscle-strengthening, bone-strengthening, and stretching. Aerobic activity is the type that benefits your heart and lungs the most.

1.8.1.1 Aerobic Activity

Aerobic activity moves your large muscles, such as those in your arms and legs. Running, swimming, walking, bicycling, dancing, and doing jumping jacks are examples of aerobic activity. Aerobic activity also is called endurance activity. Aerobic activity makes your heart beat faster than usual. You also breathe harder during this type of activity. Over time, regular aerobic activity makes your heart and lungs stronger and able to work better.

1.8.1.2 Muscle-Strengthening Activity

The other types of physical activity muscle-strengthening, bone strengthening, and stretching benefit your body in other ways. Muscle-strengthening activities improve the strength, power, and endurance of your muscles. Doing pushups and situps, lifting weights, climbing stairs, and digging in the garden are examples of muscle-strengthening activities. With bone-strengthening activities, your feet, legs, or arms support your body's weight, and your muscles push against your bones. This helps make your bones strong. Running, walking, jumping rope, and lifting weights are examples of bone-strengthening activities.

Muscle-strengthening and bone-strengthening activities also can be aerobic, depending on whether they make your heart and lungs work harder than usual. For example, running is both an aerobic activity and a bone-strengthening activity. Stretching helps improve your flexibility and your ability to fully move your joints. Touching your toes, doing side stretches, and doing yoga exercises are examples of stretching.

Levels of Intensity in Aerobic Activity You can do aerobic activity with light, moderate, or vigorous intensity. Moderate- and vigorous-intensity aerobic activities are better for your heart than light-intensity activities. However, even light-intensity activities are better than no activity at all.

The level of intensity depends on how hard you have to work to do the activity. To do the same activity, people who are less fit usually have to work harder than people who are more fit. So, for example, what is light-intensity activity for one person may be moderate-intensity for another.

Light- and Moderate-Intensity Activities Light-intensity activities are common daily activities that don't require much effort. Moderate-intensity activities make your heart, lungs, and muscles work harder than light-intensity activities do. On a scale of 0 to 10, moderate-intensity activity is a 5 or 6 and produces noticeable increases in breathing and heart rate. A person doing moderate-intensity activity can talk but not sing.

Vigorous-Intensity Activities: Vigorous-intensity activities make your heart, lungs, and muscles work hard. On a scale of 0 to 10, vigorous-intensity activity is a 7 or 8. A person doing vigorous-intensity activity can't say more than a few words without stopping for a breath.

Examples of Aerobic Activities

1. Below are examples of aerobic activities. Depending on your level of fitness, they can be light, moderate, or vigorous in intensity:
2. Pushing a grocery cart around a store
3. Gardening, such as digging or hoeing that causes your heart rate to go up

4. Walking, hiking, jogging, running
5. Water aerobics or swimming laps
6. Bicycling, skateboarding, rollerblading, and jumping rope
7. Ballroom dancing and aerobic dancing
8. Tennis, soccer, hockey, and basketball

1.8.2 Benefits of Physical Activity

1. Physical activity has many health benefits. These benefits apply to people of all ages and races and both sexes. For example, physical activity helps you maintain a healthy weight and makes it easier to do daily tasks, such as climbing stairs and shopping.
2. Physically active adults are at lower risk for depression and declines in cognitive function as they get older. (Cognitive function includes thinking, learning, and judgment skills.) Physically active children and teens may have fewer symptoms of depression than their peers.
3. Physical activity also lowers your risk for many diseases, such as coronary heart disease (CHD), diabetes, and cancer.
4. Many studies have shown the clear benefits of physical activity for your heart and lungs.
5. Physical Activity Strengthens Your Heart and Improves Lung Function
6. When done regularly, moderate- and vigorous-intensity physical activity strengthens your heart muscle. This improves your heart's ability to pump blood to your lungs and throughout your body. As a result, more blood flows to your muscles, and oxygen levels in your blood rise.
7. Capillaries, your body's tiny blood vessels, also widen. This allows them to deliver more oxygen to your body and carry away waste products.
8. Physical Activity Reduces Coronary Heart Disease Risk Factors.

9. When done regularly, moderate- and vigorous-intensity aerobic activity can lower your risk for CHD. CHD is a condition in which a waxy substance called plaque (plak) builds up inside your coronary arteries. These arteries supply your heart muscle with oxygen-rich blood.
10. Plaque narrows the arteries and reduces blood flow to your heart muscle. Eventually, an area of plaque can rupture (break open). This causes a blood clot to form on the surface of the plaque.
11. If the clot becomes large enough, it can mostly or completely block blood flow through a coronary artery. Blocked blood flow to the heart muscle causes a heart attack.
12. Certain traits, conditions, or habits may raise your risk for CHD. Physical activity can help control some of these risk factors because it:
 - Can lower blood pressure and triglyceride (tri-GLIS-er-ide) levels. Triglycerides are a type of fat in the blood.
 - Can raise HDL cholesterol levels. HDL sometimes is called “good” cholesterol.
13. Helps your body manage blood sugar and insulin levels, which lowers your risk for type 2 diabetes.
14. Reduces levels of C-reactive protein (CRP) in your body. This protein is a sign of inflammation. High levels of CRP may suggest an increased risk for CHD.
15. Helps reduce overweight and obesity when combined with a reduced-calorie diet. Physical activity also helps you maintain a healthy weight over time once you have lost weight.
16. May help you quit smoking. Smoking is a major risk factor for CHD.
17. Inactive people are nearly twice as likely to develop CHD as people who are physically active. Studies suggest that inactivity is a major risk factor for CHD, just like high blood pressure, high blood cholesterol, and smoking.(**WHO, 2000**)

1.9 FAMILY COHESION

Family cohesion refers to the relationships and operational links between individuals who recognize each other as part of the same family unit. The avoidance of tensions and conflicts over a declining resource base, opportunities to observe and learn from nature, the ability to express cultural and spiritual values and the ability to participate in nature based activities is important to family cohesion. Social interactions between close friends and family members are critical to wellbeing, and are usually cited as the primary determinant of individual subjective wellbeing. In particular, interactions and the quality of the relationship with a partner can moderate the effect of negative events of life conditions and assist in maintaining a stable level of wellbeing. Outdoor recreation provides opportunities for shared experiences for families, groups of friends and communities. These shared experiences reinforce social bonds with family and friends and support social cohesion at the community level **(Olson, Russell, & Sprenkle, 1982)**.

Family cohesion has been defined as the emotional bonding that family members have toward one another (Olson, Russell, & Sprenkle, 1982). Within Latino families, cohesion has been identified as a protective factor against external stressors (Hovey & King, 1996;Salgado de Snyder, 1987). The protective factor of family cohesion against distress has been considered a function of Latino families close knit relations, sharing sense of loyalty, reciprocity and solidarity among its members (Hovey & King, 1996). In general, a high level of perceived family cohesion and support has also been identified as the most distinctive dimension of Hispanic families (Sabogal, Marin, & Otero-Sabogal, 1987). Indeed, there is evidence that perceived social support from families is related to lower levels of psychological distress among Latino groups (Rivera, 2007; Vega, Kolody, Valle, & Weir, 1991). The strong emotional bonds measured by family cohesion are expected to promote family support.

1.9.1 Strengthening Family Cohesion

The Family cohesion enhances healthy family functioning by strengthening family cohesiveness. The entire Family Enrichment Weekend, from the moment the family is registered for the event, is focused on strengthening family cohesion. Family cohesion entails the emotional bonding family members have with one another (Olson, Russell, & Sprenkle 1984). Families who have healthy levels of cohesion emotionally

interact with one another and find balance that supports individual independence and family togetherness. Healthy family cohesion is not only a strength, but a resource for families that will assist them in facing the daily challenges of raising a child with autism, assisting in maintaining a healthy marriage, and in providing a nurturing environment for all the children in the family.

Family members from cohesive family environments feel included and emotionally connected with the family. Maintaining a cohesive family is difficult for the family who has a child with autism. The families become fragmented due to the high needs of the child with autism. The emotional bonding of the family as a unit is compromised and there is a loss of family togetherness. For families who have a child with a autism, family activities, including family outings, family meals, family holidays, are often unsuccessful, thereby compromising the development of healthy family cohesion. The most important goal of the Family Enrichment Weekend is to strengthen cohesion in each attending family. This inclusive, supportive environment contributes to successful family interactions and assists families in finding and maintaining cohesion. Throughout the Family Enrichment Weekend there are family activities specifically designed to increase cohesion and opportunities for family members to appreciate the talents of each family member. There is intensive assistance for each family in all activities, including family meals to ensure successful participation in a relaxed and accepting environment. The Family Enrichment Weekend gives families the opportunity to experience a model for maintaining and strengthening family cohesion. Some activities are planned within the Weekend where family members are together, other activities separate all or some of the family members. Children's play, game and dress-up activities separate them from their parents, and sometimes from one another if they are grouped by age. During these times parents participate in discussions built around their own educational and support needs. Mealtimes are always family times. When they come together at mealtime and for family activities there is the opportunity to share. The sharing is strategically planned where the children perform or show the parents what they did in their sessions. The closing event includes a video presentation of all the activities so that parents can see what their child was doing and the children can see what Mom and Dad were doing.

Attention to individual and family needs throughout the weekend, increases the emotional bonds among all family members. The activities and support are described

in detail in Parts 2 and 3 of this manual. For families to benefit fully and to strengthen family cohesion all family members must attend the event. This includes both parents, if both parents are in the home, and all the children living in the home. If one family member cannot be present it will compromise the value of the Family Enrichment Weekend for the family. In addition, all family members need to attend all the sessions. This is difficult for individuals who may be hesitant to participate in group sessions. Every effort is made to create a relationship with a staff person or another individual who will be attending to encourage participation. This is often done prior to the event so that the individual will be comfortable at the Family cohesion (**Olson, Russell & Sprenkle, 1982**).

1.10 EATING ATTITUDE

Food choice, like any complex human behavior, is influenced by many interrelated factors. The key driver for eating is of course hunger and satiety, but what we choose to eat is not determined solely by physiological or nutritional needs (**Johnson C, 1985**).

Other factors that influence our food choice are:

1. The sensory properties of foods, such as taste, smell or appearance.
2. Social, emotional and cognitive factors, such as likes and dislikes, knowledge and attitudes related to diet and health, habit or social context when eating condition our choice. Personal values, life experiences such as marital/co-habitation status, or skills (e.g. cooking), a person's beliefs (e.g. about issues like organic and GM), and perceptions, such as perceived barriers to eating a healthy diet, may be particularly important for certain individuals.
3. Cultural, religious and economic factors also constrain our choice. Education, ethnicity and availability, visibility or prices of products play a major role in our food choice.

This multitude of factors illustrates that “healthy eating”, which is the goal of public health campaigns, is only one of many considerations relevant to food choice.

Eating attitude evolves during the first years of life as biological and behavioral processes directed towards meeting requirements for health and growth. For the vast

majority of human history, food scarcity has constituted a major threat to survival, and human eating behavior and child feeding practices have evolved in response to this threat. Because infants are born into a wide variety of cultures and cuisines, they come equipped as young omnivores with a set of behavioral predispositions that allow them to learn to accept the foods made available to them. During historical conditions of scarcity, family life and resources were devoted to the procurement and preparation of foods, which are often low in energy, nutrients, and palatability. In sharp contrast, today in non-Third World countries children's eating habits develop under unprecedented conditions of dietary abundance, where palatable, inexpensive, ready-to-eat foods are readily available

What we eat affects how we feel. Food should make us feel good. It tastes great and nourishes our bodies. When eaten in too little or in excessive quantities, however, our health and appearance can be altered, which can create negative feelings toward food. By learning how to make better choices, you might be able to control compulsive eating, bingeing, and gaining weight. In addition to better appetite control, you might also experience feelings of calmness, high energy levels, or alertness from the foods you eat.

Experts believe there are many factors that can influence our feelings about food and our eating behaviors. These include:

1. Cultural factors
2. Evolutionary factors
3. Social factors
4. Familial factors
5. Individual factors

There also are positive and negative consequences associated with eating. For example, food might help you to cope with negative feelings in the short-term. In the long term, however, coping with stress by eating can actually increase negative feelings because you aren't actually coping with the problem causing the stress. Further, your self-image might become more negative as you gain weight.

1.11 DEHYDROEPIANDROSTERONE (DHEA)

Dehydroepiandrosterone (DHEA) is a hormone produced by the body's adrenal glands. These are glands just above the kidneys. DHEA supplements can be made from wild yam or soy. But they do know that it functions as a precursor to male and female sex hormones, including testosterone and estrogen. Precursors are substances that are converted by the body into a hormone. DHEA production peaks in the mid-20s. In most people, production gradually declines with age. Testosterone and estrogen production also generally declines with age. DHEA supplements can increase the level of these hormones. That's why a number of claims have been made about their potential health benefits **(Joseph Saling, 2014)**.

Those claims range from benefits such as:

1. Building up the adrenal gland
2. Strengthening the immune system
3. Slowing natural changes in the body that come with age
4. Providing more energy
5. Improving mood and memory
6. Building up bone and muscle strength

Natural DHEA production is at its highest in the twenties: by the time we reach seventy we only make about 20% of the DHEA we had when we were young. A decline in DHEA with the passage of time is clearly what nature intended and as far as we know, a healthy process. This is only one of the major reasons we don't recommend self-prescribing DHEA through over-the-counter products. Another reason is that DHEA is a very powerful precursor to all of your major sex hormones: estrogen, progesterone, and testosterone. (It's molecular structure is closely related to testosterone). We call it the "mother hormone" the source that fuels the body's metabolic pathway:

Besides DHEA, the adrenals also make the stress hormones cortisol and adrenaline. Adrenal exhaustion from coping with chronic stress from (among other things) poor nutrition, yo-yo dieting, emotional turmoil, and job-related stress means

your adrenals are bone-tired from pumping out cortisol and they simply can't manufacture enough DHEA to support a healthy hormonal balance. It's likely that DHEA and adrenal function are related to neurotransmitter-release rates, based on the mood elevation our patients report after just two weeks of adrenal support. But more research is needed to isolate the individual effects of DHEA from the hormones it gets metabolized into before we can know for sure what part it plays in all of this.

One thing we do know is that adequate levels of DHEA are needed to ensure your body can produce the hormones it needs when it needs them. In that balanced state your mood is stable and you feel clear-headed, joyful and vigorous. DHEA is the best "feel-good" hormone we know. And it works quickly and effectively when taken with the right combination of support. When DHEA levels are low, your body does not have enough working material for proper endocrine function. This throws off your hormone production and you feel a general sense of malaise, along with other symptoms of hormonal imbalance how severe depends on how many other demands are being made on your body at the same time. There is a growing body of evidence that healthy levels of DHEA may help stave off Alzheimer's disease, cancer, osteoporosis, depression, heart disease and obesity, but there is still no clear-cut consensus. There may be some increased risks associated with DHEA for women with a history of breast cancer all the more reason to take DHEA under medical supervision. At our practice we use DHEA where we've seen reliable proof of efficacy in cases of adrenal imbalance.

The lifestyle, diet and stress levels all contribute to the amount of DHEA the body can produce in a given period. At our practice we look first and foremost at adrenal function, using DHEA levels as one of several diagnostic tools. Think of our exhausted mother, Lisa. Like her, your adrenals work tirelessly to meet the demands placed on them until they are utterly tapped. Without adequate support, they spiral downward into adrenal imbalance and eventually adrenal exhaustion. Most of the women we see at our practice and I mean 99% have some indication of adrenal imbalance, including symptoms of low DHEA levels, such as:

1. Extreme fatigue
2. Decrease in muscle mass
3. Decrease in bone density

4. Depression
5. Aching joints
6. Loss of libido
7. Lowered immunity

Nowadays DHEA can be purchased over-the-counter as a matter of course in a confusing variety of doses and combinations. Most of these DHEA products are geared toward men, but more and more aimed at women. The labels claim DHEA will help us lose weight, rev up our libido, lift depression and give us back the strength, immunity, and stamina we had when we were 20 the age at which our bodies naturally produced the most DHEA. While on the surface this is appealing (who wouldn't want to feel 20 again?), it's obviously not what nature intended. We also don't know enough about DHEA to be conducting such a large, unregulated public experiment. DHEA is a potent steroid that's why it's been in the headlines and why it should be approached with due diligence. Without a comprehensive medical test it's impossible to know what DHEA levels are. Just because of getting older doesn't automatically mean deficient. Remember, this is a natural substance the bodies can produce more or less of it depending on the nutrient support, metabolism, hormonal balance, activity level and emotional state. In fact, there are many studies that show improvement in the DHEA levels naturally by maintaining a body mass index of 19-25, getting adequate rest and exposure to sunlight, exercising regularly (including sexual activity), and fostering more "downtime" in your life but more on that in a moment. Also remember that any time buy a supplement at a health food store, have no guarantee that what are buying is the real deal. There are few regulations in place to police the manufacturing process or the product itself. This is the reason we have formulated our own Women to Women supplements, made specifically for us by a manufacturer who tests every single batch. Many of the DHEA supplements at the local store have very high dosages way too high for most women. While there's no way to tell how much of that might actually absorb, especially unwise to experiment with DHEA at these levels without medical supervision.

Furthermore, taking DHEA alone won't do any good as adrenals are exhausted. There are too many other factors at work. To know the status of the adrenal function

and the other hormones before it can even begin to know what kind of combination of support the body needs.

1.12 LUTEINIZING HORMONE (LH)

Luteinizing hormone is produced by the pituitary gland and is one of the main hormones that control the reproductive system. Luteinizing hormone, like follicle stimulating hormone, is a gonadotrophin hormone produced and released by cells in the anterior pituitary gland. It is crucial in regulating the function of the testes in men and ovaries in women. In men, luteinizing hormone stimulates Leydig cells in the testes to produce testosterone, which acts locally to support sperm production. Testosterone also exerts effects all around the body to generate male characteristics such as increased muscle mass, enlargement of the larynx to generate a deep voice and the growth of facial and body hair. In women, luteinizing hormone carries out different roles in the two halves of the menstrual cycle. In weeks one to two of the cycle, luteinizing hormone is required to stimulate the ovarian follicles in the ovary to produce the female sex hormone, oestradiol. Around day 14 of the cycle, a surge in luteinizing hormone levels causes the ovarian follicle to tear and release a mature oocyte (egg) from the ovary, a process called ovulation. For the remainder of the cycle (weeks three to four), the remnants of the ovarian follicle form a corpus luteum. Luteinizing hormone stimulates the corpus luteum to produce progesterone which is required to support the early stages of pregnancy, if fertilization occurs (**Kaplan LA, 1996**).

The secretion of luteinizing hormone from the anterior pituitary gland is regulated through a system called the hypothalamic-pituitary-gonadal axis. Gonadotrophin-releasing hormone is released from the hypothalamus and binds to receptors in the anterior pituitary gland to stimulate both the synthesis and release of luteinizing hormone (and follicle stimulating hormone). The released luteinizing hormone is carried in the bloodstream where it binds to receptors in the testes and ovaries to regulate their hormone secretions and the production of sperm or eggs.

The release of hormones from the gonads can suppress the secretion of gonadotrophin-releasing hormone and, in turn, luteinizing hormone from the anterior pituitary gland. When levels of hormones from the gonads fall the reverse happens and gonadotrophin releasing hormone and hence luteinizing hormone rise. This is known as negative feedback. In men, testosterone exerts this negative feedback and in

women oestrogen and progesterone exert the same effect except at the midpoint in the menstrual cycle. At this point, high oestrogen secretions from the ovary stimulate a surge of luteinizing hormone from the pituitary gland, which triggers ovulation.

The fine tuning of luteinizing hormone release is vital to maintaining fertility. Because of this, compounds designed to mimic the actions of gonadotrophin-releasing hormone, luteinising hormone and follicle stimulating hormone are used to stimulate gonadal function in assisted conception techniques such as in vitro fertilization (IVF). Measuring the levels of luteinising hormone present in urine can be used to predict the timing of the luteinising hormone surge in women, and hence ovulation. This is one of the methods employed in ovulation prediction kits used by couples wishing to conceive.

Too much luteinising hormone can be an indication of infertility. Since the secretion of luteinising hormone is tightly controlled by the hypothalamic-pituitary-gonadal axis, high levels of luteinising hormone in the bloodstream can indicate decreased sex steroid production from the testes or ovaries (eg, as in premature ovarian failure). Polycystic ovary syndrome is a common condition in women associated with high levels of luteinising hormone and reduced fertility. In this condition, an imbalance between luteinising hormone and follicle stimulating hormone can stimulate inappropriate production of testosterone. Genetic conditions, such as Klinefelter's syndrome and Turner syndrome, can also result in high luteinising hormone levels. Klinefelter's syndrome is a male-only disorder and results from carrying an extra X chromosome (so that men have XXY, rather than XY chromosomes). As a result of this, the testes are small and do not secrete adequate levels of testosterone to support sperm production. Turner syndrome is a female-only disorder caused by a partial or full deletion of an X chromosome (so that women have XO, rather than XX). In affected patients, ovarian function is impaired and therefore luteinising hormone production increases to stimulate ovarian function.

Too little luteinising hormone will also result in infertility in both men and women, as a critical level of luteinising hormone is required to support testicular or ovarian function. In men, an example of a condition where low levels of luteinising hormone are found is Kallmann's syndrome, which is associated with a deficiency in

gonadotrophin-releasing hormone secretion from the hypothalamus. In women, a lack of luteinising hormone means that ovulation does not occur.

Luteinizing hormone (LH) is an important hormone both men and women produce. This hormone is known as a gonadotrophin, and it affects the sex organs in both men and women. For women, it affects ovaries, and in men, it affects the testes. LH plays a role in puberty, menstruation, and fertility. LH is a hormone that's produced in the pituitary gland. The pituitary gland is located at the base of the brain, and it's roughly the size of a pea. If you're a woman, LH is an important part of your menstrual cycle. It works with follicle-stimulating hormone (FSH), which another gonadotrophin made in the pituitary gland. FSH stimulates the ovarian follicle, causing an egg to grow. It also triggers the production of estrogen in the follicle. The rise in estrogen tells your pituitary gland to stop producing FSH and to start making more LH. The shift to LH causes the egg to be released from the ovary, a process called ovulation. In the empty follicle, cells proliferate, turning it into a corpus luteum. This structure releases progesterone, a hormone necessary to maintain pregnancy. If pregnancy doesn't occur, the levels of progesterone drop off and the cycle begins again. If you're a man, your pituitary gland also produces LH. The hormone binds to receptors in certain cells in your testes called Leydig cells. This leads to the release of testosterone, a hormone that's necessary for producing sperm cells.

Examples of instances when the doctor may order an LH blood test include:

1. A woman is having difficulty getting pregnant
2. A woman has irregular or absent menstrual periods
3. It's suspected that a woman has entered menopause
4. A man has signs of low testosterone levels, such as low muscle mass or decrease in sex drive.
5. A pituitary disorder is suspected.
6. A boy or girl appears to be entering puberty too late or too soon.

Increased levels of LH and FSH can indicate a problem with the ovaries. This is known as primary ovarian failure. Some causes of primary ovarian failure can include:

1. Ovaries that are not properly developed
2. Genetic abnormalities, such as Turner syndrome

3. Exposure to radiation
4. History of taking chemotherapy drugs
5. Autoimmune disorders
6. Ovarian tumor
7. Thyroid or adrenal disease
8. Polycystic ovary syndrome (PCOS)

Low levels of both LH and FSH can indicate secondary ovarian failure. This means another part of the body causes ovarian failure. In many cases, this is the result of problems with the areas of the brain that make hormones, such as the pituitary gland. If you're a man, high LH levels can indicate primary testicular failure. The causes of this condition can include:

1. Chromosome abnormalities, such as Klinefelter syndrome
2. Gonad development failure
3. A history of viral infections, such as the mumps
4. Trauma
5. Radiation exposure
6. History of taking chemotherapy medications
7. Autoimmune disorders
8. Tumors, such as a germ cell tumor

Secondary testicular failure can also be due to a brain-related cause, such as a disorder in the hypothalamus. Also, if your doctor has given you the GnRH shot and your LH levels went down or stayed the same, a pituitary disease is often to blame. For children, high levels of LH can cause early puberty. This is known as precocious puberty. According to the American Association of Clinical Chemistry (AACC), girls are more likely to experience this condition than boys. Underlying causes of this can include: **(Kaplan LA, 1996)**

1. A tumor in the central nervous system
2. Trauma or brain injury
3. Inflammation or infection in the central nervous system, such as meningitis or encephalitis

4. History of brain surgery

Delayed puberty with normal or lower LH levels can indicate underlying disorders, including:

1. Ovarian or testicular failure
2. Hormone deficiency
3. Turner syndrome
4. Klinefelter syndrome
5. Chronic infection
6. Cancer
7. An eating disorder

Testing LH has the potential to indicate a number of development- and fertility-related disorders. If your doctor suspects you may have a condition that affects the ovaries, testicles, or the parts of the brain that make LH, the test can provide more information.

1.13 GONADOTROPHIN-RELEASING HORMONE (GnRH)

Gonadotrophin-releasing hormone is produced and secreted by specialized nerve cells in the hypothalamus of the brain. It is released into tiny blood vessels that carry this hormone from the brain to the pituitary gland where it stimulates the production of two more hormones – follicle stimulating hormone and luteinizing hormone. These hormones are released into the general circulation and act on the testes and ovaries to initiate and maintain their reproductive functions. Follicle stimulating hormone and luteinizing hormone control the level of hormones produced by the testes and ovaries (such as testosterone, oestradiol and progesterone) and are important in controlling the production of sperm in men and the maturation and release of an egg during each menstrual cycle in women. During childhood, the levels of gonadotrophin-releasing hormone are extremely low, but as puberty approaches there is an increase in gonadotrophin-releasing hormone which triggers the onset of sexual maturation (Sonis WA, 1986).

No one really knows why this occurs, but it probably involves many different factors. When the ovaries and testes are fully functional, the production of gonadotrophin-releasing hormone, luteinizing hormone and follicle stimulating

hormone are controlled by the levels of testosterone (in men) and estrogens (example, oestradiol) and progesterone (in women). If the levels of these hormones rise, the production of gonadotrophin-releasing hormone decreases and vice versa. There is one exception to this rule; in women, at the midpoint of their menstrual cycle, oestradiol (produced by the follicle in the ovary that contains the dominant egg) reaches a critical high point. This stimulates a large increase in gonadotrophin-releasing hormone secretion and, consequently, a surge of luteinizing hormone which stimulates the release of a mature egg. This process is called ovulation.

It is not known what the effects are of having too much gonadotrophin-releasing hormone. Extremely rarely, pituitary adenomas (tumours) can develop, which increase production of gonadotrophins leading to overproduction of testosterone or oestrogen. A deficiency of gonadotrophin-releasing hormone in childhood means that the individual does not go through puberty. An example is a rare genetic syndrome known as Kallmann's syndrome which causes loss of the development of gonadotrophin-releasing hormone-producing nerve cells with a consequent loss of pubertal development and sexual maturation. It is more common in men than women and leads to loss of development of the testes or ovaries and infertility.

Any trauma or damage to the hypothalamus can also cause a loss of gonadotrophin-releasing hormone secretion which will stop the normal production of follicle stimulating hormone and luteinizing hormone causing loss of menstrual cycles (amenorrhoea) in women, loss of sperm production in men and loss of production of hormones from the testes and ovaries.

1.14 FOLLICLE STIMULATING HORMONE (FSH)

Follicle stimulating hormone is one of the gonadotrophin hormones, the other being luteinizing hormone. Both are released by the pituitary gland into the bloodstream. Follicle stimulating hormone is one of the hormones essential to pubertal development and the function of women's ovaries and men's testes. In women, this hormone stimulates the growth of ovarian follicles in the ovary before the release of an egg from one follicle at ovulation. It also increases oestradiol production. In men, follicle stimulating hormone acts on the Sertoli cells of the testes to stimulate sperm production (spermatogenesis) (Nicole Galan RN, 2014).

The production and release of follicle stimulating hormone is regulated by the levels of a number of circulating hormones released by the ovaries and testes. This system is called the hypothalamic-pituitary-gonadal axis. Gonadotrophin-releasing hormone is released from the hypothalamus and binds to receptors in the anterior pituitary gland to stimulate both the synthesis and release of follicle stimulating hormone and luteinising hormone. The released follicle stimulating hormone is carried in the bloodstream where it binds to receptors in the testes and ovaries. Using this mechanism follicle stimulating hormone, along with luteinising hormone, can control the functions of the testes and ovaries. In women, when hormone levels fall towards the end of the menstrual cycle, this is sensed by nerve cells in the hypothalamus. These cells produce more gonadotrophin-releasing hormone which in turn stimulates the pituitary gland to produce more follicle stimulating hormone and luteinising hormone and release these into the bloodstream. The rise in follicle stimulating hormone stimulates the growth of the follicle in the ovary. With this growth, the cells of the follicles produce increasing amount of oestradiol and inhibin. In turn, the production of these hormones is sensed by the hypothalamus and pituitary gland and less gonadotrophin-releasing hormone and follicle stimulating hormone will be released. However as the follicle matures, and more and more oestrogen is produced from the follicles, it stimulates a surge in luteinising hormone and follicle stimulating hormone which stimulates the release of an egg from a mature follicle – ovulation.

Thus, during each menstrual cycle there is a rise in follicle stimulating hormone secretion in the first half of the cycle that stimulates follicular growth in the ovary. After ovulation the ruptured follicle forms a corpus luteum that produces high levels of progesterone. This inhibits the release of follicle stimulating hormone. Towards the end of the cycle the corpus luteum breaks down, progesterone production declines and the next menstrual cycle begins when follicle stimulating hormone starts to rise again.

In men, the production of follicle stimulating hormone is regulated by the circulating levels of testosterone and inhibin, both produced by the testes. Follicle stimulating hormone regulates testosterone levels and when these rise they are sensed by nerve cells in the hypothalamus so that gonadotrophin-releasing hormone secretion and consequently follicle stimulating hormone is decreased. The opposite occurs when testosterone levels decrease. This is known as a negative feedback control so that the

production of testosterone remains steady. The production of inhibin is also controlled in a similar way but this is sensed by cells in the anterior pituitary gland rather than the hypothalamus.

Most often, raised levels of follicle stimulating hormone are a sign of malfunction in the ovary or testis. If the gonads fail to create enough oestrogen, testosterone and/or inhibin, the correct feedback control of follicle stimulating hormone production from the pituitary gland is lost and the levels of both follicle stimulating hormone and luteinising hormone will rise. This condition is called hypergonadotrophic-hypogonadism, and is associated with primary ovarian failure or testicular failure. This is seen in conditions such as Kallmann's syndrome in men and Turner syndrome in women. In women, follicle stimulating hormone levels also start to rise naturally in women around the menopausal period, reflecting a reduction in function of the ovaries and decline of oestrogen and progesterone production. There are very rare pituitary conditions that can raise the levels of follicle stimulating hormone in the bloodstream. This overwhelms the normal negative feedback loop and can cause ovarian hyper stimulation syndrome in women. Symptoms of this include enlarging of the ovaries and a potentially dangerous accumulation of fluid in the abdomen (triggered by the rise in ovarian steroid output), which leads to pain in the pelvic area.

In women, a lack of follicle stimulating hormone leads to incomplete development at puberty and poor ovarian function (primary ovarian failure). In this situation ovarian follicles do not grow properly and do not release an egg, thus leading to infertility. Since levels of follicle stimulating hormone in the bloodstream are low, this condition is called hypogonadotrophic-hypogonadism. Sufficient follicle stimulating hormone action is also needed for proper sperm production. In the case of complete absence of follicle stimulating hormone in men, lack of puberty and infertility due to lack of sperm (azoospermia) can occur. Partial follicle stimulating hormone deficiency in men can cause delayed puberty and limited sperm production (oligozoospermia), but fathering a child may still be possible. If the loss of follicle stimulating hormone occurs after puberty, there will be a similar loss of fertility.

1.15 REASON FOR SELECTION OF THE TOPIC

In modern world Sedentary lifestyle or the lack of physical exercise, obesity and at times the cause can even be your genes. Parents should make sure to give balanced

nutritional diet to their children. Child should be on a healthy balanced diet, and that they are also getting enough physical exercise. Equip the girls with more awareness on how to behave around strangers and how to identify sex abuse, so they can prevent or report such incidents. A complete education on the female anatomy, puberty-related changes and sexuality would not be appropriate, because discussing these issues openly is not part of Indian culture.

The psycho physical form of practice will be the best remedy on solution for the puberty. Yoga is the only traditional of therapy accepted by the WHO. This is the very reason for choosing this topic for research.

1.16 REASONS FOR THE SELECTION OF THE VARIABLES

Puberty girls are facing more physical and emotional problems due to sudden hormonal changes and because of current life style and food habits and lack of exercises. Socio environmental variables and pubertal development dimensional variables are selected as dependent variables where Static Hatha Yoga Sadhana and Dynamic Hatha Yoga Sadhana are selected as independent variables.

1.17 STATEMENT OF THE PROBLEM

The purpose of the present study was to find out the effect of static and dynamic hatha yoga sadhana on selected socio environmental and pubertal development dimension among preteen girls.

1.18 HYPOTHESES

1. It was hypothesized that there would be a significant reduction in the Socio environmental dimensions namely 'Sedentary behavior' due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
2. It was hypothesized that there would be a better significant reduction in the Socio environmental dimensions namely 'Sedentary behavior' due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.

3. It was hypothesized that there would be a significant improvement in the Socio environmental dimensions namely 'Physical activity' due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
4. It was hypothesized that there would be a better significant improvement in the Socio environmental dimensions namely 'Physical activity' due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.
5. It was hypothesized that there would be a significant improvement in the Socio environmental dimensions namely 'Family cohesion' due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
6. It was hypothesized that there would be a better significant improvement in the Socio environmental dimensions namely 'Family cohesion' due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.
7. It was hypothesized that there would be a significant improvement in the Socio environmental dimensions namely 'Eating attitude' due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
8. It was hypothesized that there would be a better significant improvement in the Socio environmental dimensions namely 'Eating attitude' due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.
9. It was hypothesized that there would be a significant improvement in the Pubertal developmental dimensions namely 'Dehydroepiandrosterone (DHEA)' due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
10. It was hypothesized that there would be a better significant improvement in the Pubertal developmental dimensions namely 'Dehydroepiandrosterone (DHEA)' due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.

11. It was hypothesized that there would be a significant reduction in the Pubertal developmental dimensions namely ‘Luteinizing hormone (LH)’ due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
12. It was hypothesized that there would be a better significant reduction in the Pubertal developmental dimensions namely ‘Luteinizing hormone (LH)’ Sedentary behavior due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.
13. It was hypothesized that there would be a significant reduction in the Pubertal developmental dimensions namely ‘Gonadotrophin releasing hormone (GnRH)’ due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
14. It was hypothesized that there would be a better significant reduction in the Pubertal developmental dimensions namely ‘Gonadotrophin releasing hormone (GnRH)’ due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.
15. It was hypothesized that there would be a significant reduction in the Pubertal developmental dimensions namely ‘Follicle stimulating hormone (FSH)’ due to Static and Dynamic hatha yoga sadhana practices among preteen girls.
16. It was hypothesized that there would be a better significant reduction in the Pubertal developmental dimensions namely ‘Follicle stimulating hormone (FSH)’ due to Dynamic hatha yoga sadhana practice than the Static hatha yoga sadhana practice among preteen girls.

1.19 SIGNIFICANCE OF THE STUDY

The significance of the present study are as follows.

1. This study would be helpful for the society to understand the early pubertal complication.
2. This study would be helpful for improve the preteen girls.
3. This study would be helpful for medical professional and yoga therapists.
4. The study would be helpful for the further research on pubertal developments.

5. Having the socio environmental and pubertal development as the variables, the parents would to take steps to implement the strategy wherever necessary.

1.20 DELIMITATIONS

The present study was delimited into the following aspects.

1. The sample for the present study was delimited from to pubertal development preteen girls only from Chennai city.
2. The age of the subjects were ranging from 9 to 12 years.
3. The total numbers of subjects were 30 preteen girls, in which 10 for experimental group I (Static Hatha Yoga Sadhana), 10 for experimental group II (Dynamic Hatha Yoga Sadhana), and 10 for Control group were taken for the study.
4. The subjects were experimentally treated with Static and Dynamic Hatha Yoga Sadhana.
5. The study was conducted on dependent variables socio environmental dimensions such as Sedentary behavior, Physical activity, Family cohesion, Eating attitude, and pubertal developmental dimensions such as Dehydroepiandrosterone (DHEA) Test, Luteinizing hormone (LH) Test, Gonadotrophin releasing hormone (GnRH) Test, and Follicle stimulating hormone (FSH) Test.
6. The experimental period was fixed as 15 weeks and five days in a week between 7 am to 8 am.
7. The standardized as well modified tests were used to collect related data on the selected dependent variables.

1.21 LIMITATIONS

The limitations of the present study were as follows.

1. Allopathic Medication, food habits, rest period, life style etcetera could not be controlled.

2. Since the nature of disorder condition and limitation in subject availability, Geographical differences, Living standard, environment factors which might be influence on the data was not considered, during the period of testing.
3. The previous undertaken therapies and life supportive equipment's of the subjects in preteen girls, which might be influence on the data was not considered.

1.22 MEANING AND DEFINITION OF THE TERMS

1.22.1 YOGA

The term yoga comes from a Sanskrit word which means yoke or union. Traditionally, yoga is a method joining the individual self with the Divine, Universal Spirit, or Cosmic Consciousness. Physical and mental exercises are designed to help achieve this goal, also called self-transcendence or enlightenment (**Stuart Ray Sarbacker, 2005**).

1.22.2 PRANAYAMA

Pranayama is generally defined as breath control. the word pranayama is comprised of two roots: *prana* plus *ayama*. Prana means 'vital energy' or 'life force'. (**Swami Satyananda Saraswati, 1996**)

1.22.3 STATIC YOGA

Static Yoga is Hatha Yoga or Restorative Yoga – yoga that is more slower-paced, calm and peaceful. Static yoga is geared towards classical postures that improve balancing, strength and flexibility. This helps to stimulate the body's nervous system, which controls the functioning systems of the rest of the body such as the muscular, digestive, immune, respiratory and cardiovascular systems. (**Gilbert NG, 2009**)

1.22.4 DYNAMIC YOGA

Dynamic Yoga is Ashtanga, Power Yoga or Yoga Core – yoga that is fast-paced and energetic; providing the body with a good cardiovascular workout and enhancing blood circulation. This helps to improve one's lymphatic function which, in turn, builds

up the immune system and prevents one from being susceptible to illnesses. **(Gilbert NG, 2009)**

1.22.5 SOCIAL ENVIRONMENT

The social environment, social context, socio-cultural context or milieu refers to the immediate physical and social setting in which people live or in which something happens or develops. It includes the culture that the individual was educated or lives in, and the people and institutions with whom they interact. **(Elizabeth Barnett, Michele Casper, 2001)**

1.22.6 PUBERTY

Puberty is the process of physical changes through which a child's body matures into an adult body capable of sexual reproduction to enable fertilization. It is initiated by hormonal signals from the brain to the gonads: the ovaries in a girl, the testes in a boy. In response to the signals, the gonads produce hormones that stimulate libido and the growth, function, and transformation of the brain, bones, muscle, blood, skin, hair, breasts and sex organs. Physical growth height and weight accelerates in the first half of puberty and is completed when the child has developed an adult body. Until the maturation of their reproductive capabilities, the pre-pubertal physical differences between boys and girls are the external sex organs. On average, girls begin puberty at ages 10–11; boys at ages 11–12. **(Kail, RV and Cavanaugh JC, 2010)**

1.22.7 SEDENTARY BEHAVIOR

Sedentary behavior refers to any waking activity characterized by an energy expenditure ≤ 1.5 metabolic equivalents *and* a sitting or reclining posture. In general this means that any time a person is sitting or lying down, they are engaging in sedentary behavior. Common sedentary behaviors include TV viewing, video game playing, computer use (collective termed “screen time”), driving automobiles, and reading. **(Sedentary Behavior Research Network, 2012)**

1.22.8 PHYSICAL ACTIVITY

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure **(WHO, 2000)**.

1.22.9 FAMILY COHESION

Family cohesion has been defined as the emotional bonding that family members have toward one another **(Olson, Russell & Sprenkle, 1982)**.

1.22.10 EATING ATTITUDE

Definition of Eating attitude, based on "what, how, with what, with whom, where and when we eat, why we eat that, in which situation we eat, what we think and feel towards food. it is also important to ask in what are food choices based on, and where there is difficulty, lack of control, aversion, and what are the feelings related to food. **(Johnson C, 1985)**

1.22.11 FOLLICLE STIMULATING HORMONE (FSH)

Follicle Stimulating Hormone is a hormone released from the pituitary gland in the brain that stimulates an egg follicle to grow each month as part of the menstrual cycle. Elevated blood levels of FSH indicate ovarian maturing, as greater amounts of the hormone are required for the ovary to recruit and stimulate an egg follicle. **(Nicole Galan RN, 2014)**

1.22.12 LUTEINIZING HORMONE TEST (LH)

LH is a hormone secreted by the pituitary gland. It, along with FSH, helps a woman's egg mature and develop. There is a surge of LH right before ovulation that triggers the egg's release from the ovary, and this surge is what at-home ovulation predictor kits look for. In men, LH is involved in the production of testosterone, which in turn affects sperm cell growth and development **(Kaplan LA, 1996)**.

1.22.13 GONADOTROPHIN-RELEASING HORMONE (GnRH)

A kind of fertility drug, GnRH agonists is artificial hormones that mimic the body's natural hormone gonadotrophin-releasing hormone (GnRH). A GnRH agonist

first leads to a rapid increase in the production of the hormones FSH and LH. However, after this brief increase, the pituitary gland stops producing the hormones, preventing ovulation **(Sonis WA, 1986)**.

1.22.14 DEHYDROEPIANDROSTERONE (DHEA)

Dehydroepiandrosterone (DHEA) is a hormone produced by your body's adrenal glands. These are glands just above your kidneys. it functions as a precursor to male and female sex hormones, including testosterone and estrogen. Precursors are substances that are converted by the body into a hormone **(Joseph Saling, 2014)**.