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Keynote Address

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FITNESS AND WELLNESS THROUGH SPORTS

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Recognition of the salutogenic effect of physical activity, especially by medical professionals can be traced back to the 9th century before Christ. The global decline in physical education has forced training institutions to adapt their curriculum in order to survive. The most common problems in the world were infectious diseases, such as tuberculosis, diphtheria, influenza, kidney disease and other diseases of infancy. Its best medicine to understand to prevent the chronic disease and a wellness and fitness movement development gradually. Now a days people can able to understand that good health is mostly self controlled and that the leading causes of premature death and illness. Therefore, we all desire to live long and happy life, wellness programs focus on enhancing the overall quality of life. Most of the people are become very must aware about the fitness and wellness. They are following and participating the regular physical activities and exercise programmes.

Fitness is defined as the quality of being suitable to perform a particular task. Modern definition of fitness describe either a person or machine's ability to perform a specific function or a holistic definition of human adaptability to cope with various situations. Fitness is attributed to personnel who possess significant aerobic or anaerobic ability, i.e. strength or endurance. fitness include strength, endurance, power, speed, balance and coordination and being able to improve the amount of work done in a given time. This is often presented in a triangle made up of physical, emotional, and mental fitness. Physical fitness can also prevent or treat many chronic health conditions brought on by unhealthy lifestyle or aging.

Developing research has demonstrated that many of the benefits of exercise are mediated through the role of skeletal muscle as an endocrine organ. That is, contracting muscles release multiple substances known as myokines which promote the growth of new tissue, tissue repair, and various anti-inflammatory functions, which in turn reduce the risk of developing various inflammatory diseases.

With automation and changes in lifestyles *physical fitness* is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

Physical fitness effects

Controls blood pressure: Physical Fitness has proven to result in positive effects on the body's blood pressure. This is because staying active and exercising regularly builds up a stronger heart. The heart is the main organ in charge of systolic blood pressure and diastolic blood pressure. Engaging in a physical activity will create a rise in blood pressure, once the activity is stopped, however, the individual's blood pressure will return to normal. The more physical activity that one engages in, the easier this process becomes, resulting in a more 'fit' individual. Through regular physical fitness, the heart does not have to work as hard to create a rise in blood pressure, which lowers the force on the arteries, and lowers the overall blood pressure.

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Cardiovascular disease prevention: Physical activity effects one's blood pressure, cholesterol levels, blood lipid levels, blood clotting factors and the strength of blood vessels. It also improves the body's use of insulin. People who are at risk for diabetes, Type 2 (insulin resistant) especially, benefit greatly from physical activity because it activates a better usage of insulin and protects the heart. In regards to people with lower blood pressure or cholesterol, we recommend that these individuals aim for around forty minutes of moderate to vigorous physical activity around three or four times a week.

***Weight control*:** Achieving resilience through physical fitness promotes a vast and complex range of health related benefits. Being physically fit regulates body weight, insulin resistance, sex hormones, inflammation, and a healthy immune system. Individuals who keep up physical fitness levels generally regulate their distribution of body fat and stray away from obesity. Abdominal fat, specifically visceral fat, is most directly affected by engaging in aerobic exercise. Strength training has been known to increase the amount of lean muscle in the body, however it can also reduce body fat.

Health is the level of functional or metabolic efficiency of a living organism. In humans it is the ability of individuals or communities to adapt and self-manage when facing physical, mental or social challenges. The three interdependent fields to determine the health status of an individual are :

- Lifestyle: the aggregation of personal decisions that can be said to contribute to, or cause, illness or death;
- Environmental: all matters related to health external to the human body and over which the individual has little or no control;
- Biomedical: all aspects of health, physical and mental, developed within the human body as influenced by genetic make-up.

Wellness is generally used to mean a healthy balance of the mind, body and spirit that results in an overall feeling of well-being. Wellness is a direction in progress toward an ever-higher potential of functioning

Wellness grew as a popular concept starting in the 19th century, just as the middle class began emerging in the industrialized world, and a time when a newly prosperous public had the time and the resources to pursue wellness and other forms of self-improvement. Wellness is an active process of becoming aware of and making choices toward a healthy and fulfilling life. Wellness is more than being free from illness; it is a dynamic process of change and growth.

Maintaining an optimal level of wellness is absolutely crucial to live a higher quality life. Wellness matters. Wellness matters because everything we do and every emotion we feel relates to our well-being. In turn, our well-being directly affects our actions and emotions. It's an ongoing circle. Therefore, it is important for everyone to achieve optimal wellness in order to subdue stress, reduce the risk of illness and ensure positive interactions.

***Eight Dimensions of Wellness*:** There are eight dimensions of wellness: occupational, emotional, spiritual, environmental, financial, physical, social, and intellectual. Each dimension of wellness is interrelated with another. Each dimension is equally vital in the pursuit of optimum health. One can reach an optimal level of wellness by understanding how to maintain and optimize each of the dimensions of wellness.

Physical Wellness: Physical wellness relates to maintaining a healthy body and seeking care when needed. Physical health is attained through exercise, eating well, getting enough sleep and paying attention to the signs of illness and getting help when needed.

Physical wellness promotes proper care of our bodies for optimal health and functioning. There are many elements of physical wellness that all must be cared for together. Overall physical wellness encourages the balance of physical activity, nutrition and mental well-being to keep your body in top condition. Obtaining an optimal level of physical wellness allows you to nurture personal responsibility for your own health. As you

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become conscious of your physical health, you are able to identify elements you are successful in as well as elements you would like to improve.

Physical Wellness encourages us to care for our bodies through physical activity, proper nutrition, and a strong mind. Being physically active is crucial to keeping your body in its top condition. A few proven benefits of physical activity are strengthened bones and muscles, reduced risk of disease and stroke, and more energy.

Nutrition: It is important to nurture your body by eating a well-balanced diet. Filling yourself with a variety of nutrients and vitamins will not only help prevent illness, but will also keep your body functioning at its best.

Mental Well-Being: Having optimal levels of physical activity and maintaining proper nutrition is key to improving your overall emotional wellness. Not only will you sharpen your thinking and learning abilities, you will also enhance your sense of self-esteem and self-control.

Understanding the relationship between your body's physical health and mental health is crucial in order to develop a balanced physical wellness. When you take the route to physical wellness you will learn to understand how your body preforms physically and be able to connect it to how you feel mentally. Physical wellness encourages principles of good health and knowledge, which affect behavior patterns that lead to a healthy lifestyle. Below are a few suggestions for you to practice to maintain an optimal level of physical wellness.

- Engage in physical activity everyday for 30 minutes. You may break up your daily 30 minutes into 10 minutes bouts.
- Use stairs instead of the elevator or escalator and walk whenever possible.
- Learn to recognize warning signs when your body begins feeling ill.
- Eat a variety of healthy foods and control your meal portions.
- Maintain a regular sleep schedule and get between 7-9 hours of sleep each night.
- Practice safe sex.

It's important knowledge for us to realize health and wellness by including the above. To overcome the problems the people must keep them engaged in the holistic work, fitness programme, community services, participation in games and sports, leisure time activities etc.

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Invited Talk

Fitness down the ages'…

Dr.P.RAVI KUMAR

PHYSICAL FITNESS

"PHYSICAL FITNESS IS THE BASIS OF
ALL ACTIVITIES OF OUR SOCIETY.
IF OUR BODY GROW SOFT AND INACTIVE
AND IF WE FAIL TO ENCOURAGE
PHYSICAL DEVELOPMENT AND PROWESS,
WE WILL UNDERMINE OUR CAPACITY
FOR THOUGHT AND WORK"-*John F. Kennedy*

INTRODUCTION

As we enter the 21st century, one of the greatest accomplishments to be celebrated is the continuous pursuit of fitness since the beginning of man's existence. Throughout prehistoric time, man's quest for fitness has been driven by a desire to survive through hunting and gathering. Today, though no longer driven by subsistence requirements, fitness remains paramount to health and well-being. This article will highlight historical events and influential individuals who have shaped the history of fitness beginning with primitive man up to the foundation of the modern fitness movement.

Primitive man and fitness (pre-10,000 B.C)

Primitive nomadic lifestyles required the continual task of hunting and gathering food for survival (1). Tribes commonly went on one- or two- day hunting journeys for food and water. Regular physical activity apart from that necessary for hunting and gathering was also a principal component of life. Following successful hunting and gathering excursions, celebration events included trips of six to 20 miles to neighboring tribes to visit friends and family, where dancing and cultural games could often last several hours. This Paleolithic pattern of subsistence pursuit and celebration, demanding a high level of fitness and consisting of various forms of physical activity, defined human life (2).

The Neolithic Agricultural Revolution (10,000-8,000 B.C.)

The Neolithic Agricultural Revolution marked the conclusion of primitive lifestyle and signified the dawn of civilization. This historic period was defined by important agricultural developments including animal and plant domestication, and the invention of the plow. These human advancements made it possible for hunting-gathering tribes to obtain vast amounts of food while remaining in the same area, thus transforming primitive man into an agrarian (agriculture and farming) society (3). This era in history symbolizes the beginning of a more sedentary lifestyle, as man began to alleviate some hardships of life while. Simultaneously decreasing daily physical activity.

Ancient civilizations - China and India (2500-250 B.C.)

China: In China, the philosophical teachings of Confucius encouraged participation in regular physical activity (4). It was recognized that physical inactivity was associated with certain diseases (referred to as organ malfunctions and internal stoppages, which sound similar to heart disease and diabetes) were preventable

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with regular exercise for fitness. Consequently, Cong Fu gymnastics was developed to keep the body in good, working condition. Cong Fu exercise programs consisted of various stances and movements, characterized by separate foot positions and imitations of different animal fighting styles (5). In addition to Cong Fu gymnastics, other forms of physical activity existed throughout ancient China including archery, badminton, dancing, fencing, and wrestling.

India

Quieting the Mind in Ancient India

In ancient India, physical activities such as exercise and sports were not seen as being beneficial to the mind. Matters of the mind were of the utmost importance as far as Hindu and Buddhist priests were concerned. Yoga, a series of exercises that incorporate regulated breathing, concentration, and flexibility, became popular with disciplined Indians and priests, who used it as a method for emptying their minds of thoughts before meditating.

In India, individual pursuit of fitness was discouraged as the religious beliefs of Buddhism and Hinduism emphasized spirituality and tended to neglect development of the body. Consequently, the importance of fitness within society in general was relatively low. However, an exercise program similar to Chinese Cong Fu gymnastics developed, while still conforming to religious beliefs, known as Yoga. Though its exact origin has yet to be identified, Yoga has existed for at least the past 5000 years. Translated, Yoga means union, and refers to one of the classic systems of Hindu philosophy that strives to bring together and personally develop the body, mind, and spirit. Yoga was originally developed by Hindu priests who lived frugal lifestyles characterized by discipline and meditation. Through observing and mimicking the movement and patterns of animals, priests hoped to achieve the same balance with nature that animals seemed to possess. This aspect of Yoga, known as Hatha Yoga, is the form with which Westerners are most familiar and is defined by a series of exercises in physical posture and breathing patterns (5). Bedsides balance with nature, ancient Indian philosophers recognized health benefits of Yoga including proper organ functioning and whole well-being. These health benefits have also been acknowledged in the modern-day United States, with an estimated 12 million individuals regularly participating in Yoga

National Fitness Crops. –

This department was put into operation in the beginning of 1963, as recommended by the Kunzru Committee, by merging National Discipline Scheme, Auxiliary Cadet Corps and Physical Education. Before this, it was known as National Discipline Scheme which was started in the year 1954. It aims at developing alround personality of the students mentally, morally and physically. It also helps to bring about the national integration through national emotional songs and by adopting inter-State culture, i.e. dances, songs, etc.

At this stage, the activities taught to the students in the schools (both boys and girls) are drill marching, physical exercises, *lezim*, games and relays, track and field events, gymnastics and *malkhumb*, national emotional songs, national anthem and national flag, tippri, yoga and cultural activities.

The activities taught under the National Fitness Crops Programme inculcate discipline obedience, patriotism, firmness, steadiness, national integration and self confidence. National Physical Fitness Programme

The Scheme, was introduced by the Central Government in 1959 under the nomenclature of "National Physical Efficiency Drive" to popularize among the people the concept of physical fitness and also to arouse their enthusiasm for high standards of physical efficiency and achievement. It was renamed as the "National Physical Fitness Programme" during the year and continued to be implemented in collaboration with the State Governments, Union Territory Administrations and certain selected agencies. The Lakshmibai National College of Physical Education, Gwalior continued to function as the Central agency for the implementation of the programme. The 1978-79 National Physical Efficiency Drive, for which the final results

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have since become available, had a total participation of about 19 lakhs out of which over seven lakh participants were declared winners. On the basis of data collected by the LNCPE as well as the discussions held at the National level Seminar on the scheme held in Gangtok, in May, 1979, the scheme was modified and revised norms were laid down for the various test batteries under the scheme. Further, to make the coverage more broadbased the number of categories of the Participants was also enlarged and the revised categories now provide for Sub-Juniors, Juniors, Seniors and Adults. The programme was implemented during 1979-80 on the basis of the modified Pattern of the scheme.

The 19th All India Competition for National Awards in Physical Fitness was held at Durgapur (W.B.) from 22nd to 24th February, 1980. Out of 116 participants, who participated in the competitions from different States and Union Territories, 29 persons including 14 women won the National Awards

Fitness

As India celebrates 50 years of independent democracy, there really no better time than now to recognize the importance of a fit life. Sometimes fitness may seem like a light weight topic when we consider the more sobering task of society in overcoming poverty, hunger and assorted social inequalities. However, a fit and healthy body is the primary support behind a creative mind and a generous spirit and the integration of the these three mind, body and spirit makes total fitness.

Mass Fitness Program

To develop health and fitness through physical activity and sport a mass fitness program in India is to be launched. The following steps are considered to be taken up to improve the fitness level of Indians.

1. To educate the mass about the importance of fitness through different media
2. To create health consciousness among masses
3. To create environment for physical activity by providing play fields, trainers, physical education teachers, social workers
4. To introduce compulsory physical edu cation programme in educational institutions.

To implement health and fitness programs

The following steps have been recommended:

1. All educational institutions must provide basic information on health and fitness
2. All universities should have compulsory physical education and sport programmes as a part of educational curriculum.
3. Formation of community clubs to be encouraged to promote health, fitness - with minimum facilities for physical activity.
4. Industry and private sectors to play a dominant role in improving the environmental condition and improving living condition, socio - economic status and fitness of employees.
5. In rural areas: panchayats - to be made responsible for such programs.
6. Social organization to be involved in mass fitness programs
7. Government organization should have well defined programs to promote fitness

To summarize a number of steps are required to be taken up to promote health and fitness in India

The Near East (4000-250 B.C.)

Early political and military leaders within the civilizations of Assyria, Babylonia, Egypt, Palestine, Persia, and Syria, realizing the importance of fitness to the efficiency and performance of military forces,

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encouraged fitness throughout society (6). Perhaps the best example of a civilization utilizing fitness for political and military purposes is the Persian Empire. Persian leaders demanded strict physical fitness from its people, which was accomplished through the implementation of rigid training programs. At the age of six, boys became property of the Empire and underwent training which included hunting, marching, riding, and javelin throwing. Fitness training to improve strength and stamina was not intended for health benefits, but rather to create more able soldiers to help expand the Empire (5). The Persian Empire during its height, with its policy and emphasis on high fitness, eventually encompassed all of the Near East. However, emphasis on fitness levels throughout the Persian civilization decreased as affluence and corruption entangled political and military leaders. The downfall and collapse of the Persian Empire occurred at a time when society could largely be characterized by an overall lack of fitness

Ancient Greek Civilization (2500-200 B.C.)

Athens: Perhaps no other civilization has held fitness in such high regard as ancient Greece. The idealism of physical perfection was one that embodied ancient Greek civilization. The appreciation for beauty of the body and importance of health and fitness throughout society is one that is unparalleled in history. The Greeks believed development of the body was equally as important as development of the mind. Physical well-being was necessary for mental well-being, with the need for a strong, healthy body to harbor a sound mind. Many founding medical practitioners facilitated the growth of fitness throughout ancient Greece, including the likes of Herodicus, Hippocrates, and Galen (7).

Gymnastics, along with music, was considered to be the most important classroom topic. A common saying in ancient Greek times was "exercise for the body and music for the soul (5) ". Gymnastics took place in palaestras, which were sites of physical education for young boys. The palaestra consisted of an indoor facility for gymnastics, in addition to an outdoor area for running, jumping, and wrestling. When adulthood was reached, typically between the ages of 14 and 16, the site for fitness training switched from palaestras to gymnasiums (8). Exercise in the palaestra and gymnasium was supervised by the paidotribe, who is similar to the modern fitness trainer. This idealistic fitness situation existed most strongly within Athens, which has been characterized as a democratic society most similar to the United States.

Sparta: The Spartans of Northern Greece valued fitness even more than the Athenians. However, the heightened interest in fitness within Spartan culture was primarily for military purposes. During this era, Greek states were frequently at war with each other. Fighting skills were highly correlated with physical fitness levels, making it imperative for individuals to maintain high fitness levels. Spartan society required males to enter special fitness programs at the age of six. From this point until adulthood, the government was responsible for the child's upbringing and training. This upbringing consisted of rigorous training programs that ensured all boys would grow into highly fit adult soldiers. Females were also required to maintain good physical condition for the purpose of being able to have strong offspring who could serve the state (9). The military-dominated culture of Sparta resulted in one of the most physically fit societies in the history of mankind.

Roman Civilization (200 B.C.-476 A.D.): The Roman Empire was the antithesis of the ancient Greek civilization with the overall physical fitness condition of the Roman civilization highest during its time of conquest and expansion. During this period, all Roman citizens between the ages of 17 and 60 were eligible for the military draft. Therefore, it was imperative for all citizens to maintain good physical condition and be prepared for service. Military training consisted of activities such as running, marching, jumping, and discus and javelin throwing (10). This lifestyle resulted in strong, fit people who conquered nearly all of the Western World. However, the fitness levels of the general Roman population declined as individuals became enamored with wealth and entertainment, such as the gladiator battles. Materialistic acquisition and excess became higher

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priorities than physical condition. The lavish lifestyle and physical decay eventually took its toll as the Roman civilization fell to the physically superior Barbarian tribes from Northern Europe (11).

The Dark (476-1000) and Middle Ages (900-1400): The crumbling of the Roman Empire, which was conquered by Barbarians from Northern Europe, symbolized the beginning of a millennium of intellectual standstill. However, these occurrences were beneficial with respect to fitness. The lavish lifestyles of the Romans had resulted in the complete deterioration of the society's fitness level. The barbaric tribes from Northern Europe possessed similar characteristics to primitive people. Their lifestyle consisted of hunting and gathering food, and tending to cattle (12). Physical activity and fitness were prerequisites for survival. Therefore, despite the cultural setbacks that occurred with the fall of the Roman Empire, fitness experienced a revival during the Dark and Middle Ages

The Renaissance (1400-1600): Following the Dark and Middle Ages, the rebirth of cultural learning from the ancient Greek and Roman civilizations gave rise to the Renaissance. Accompanying this time period was a renewed interest in the human body. Once again, the ancient Greek ideals, which glorified the human body, gained widespread acceptance. Many individuals, including Martin Luther (religious leader), John Locke (philosopher), Vittorino da Feltra, John Comenius, and Richard Mulcaster (physical educators) maintained that high fitness levels enhanced intellectual learning (13, 14).

Civilizations that recognized the importance of fitness needed an avenue to convey this knowledge to their people. Therefore, fitness and physical education share a common bond. Physical education became the tool used to spread the value and benefits of fitness throughout society. School programs, primarily in ancient Greece, had previously recognized the necessity for curriculums involving physical education. The renewed appreciation for human life, which evolved during the Renaissance, created an environment which was ready for the widespread development of physical education throughout Europe.

National Period in Europe (1700-1850); Continental Europe underwent numerous cultural changes following the Renaissance. Fitness remained important and continued to follow trends initiated during the Renaissance. Physical education programs expanded within emerging nations of Europe. Intense feelings for nationalism and independence created the atmosphere for the first modern fitness movement, which came in the form of gymnastics programs. Gymnastics enjoyed immense popularity during this era, becoming especially prevalent in Germany, Denmark, Sweden, and Great Britain

Germany: The growth of gymnastics in Germany can be primarily attributed to the work of two physical educators: Johann Guts Muths and Friedrich Jahn. Guts Muths is generally referred to as the "Grandfather of German Gymnastics." He invented numerous exercise programs and the equipment upon which they were performed. His lifetime works and achievements are found in two books - Gymnastics for the Young and Games.

Friedrich Jahn earned the title of "Father of German Gymnastics" for his long-lived work. It was early during Jahn's lifetime that Napoleon conquered much of Europe, including Germany. With its downfall to France, Germany was subsequently divided into separate states. Jahn's passion for German nationalism and independence became the driving force behind his creation of gymnastic programs. He believed future susceptibility to foreign invasion could be prevented through physical development of the German people. Shortly thereafter, exercise facilities that housed apparatuses designed for running, jumping, balancing, climbing, and vaulting called Turnvereins developed throughout Germany (4).

Sweden: Per Henrik Ling developed and introduced his own gymnastics program to Sweden which consisted of three different areas: 1) educational gymnastics, 2) military gymnastics, and 3) medical gymnastics. Ling, who had a strong medical background, recognized that exercise was necessary for all persons. He maintained that exercise programs should be devised based on individual differences. Ling also believed physical educators

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must possess knowledge of the effects of exercise on the human body. Ling used science and physiology to better understand the importance of fitness (4).

Denmark: Frank Nachtegall, who initially started teaching out of his home, introduced and helped popularize gymnastic programs throughout Denmark. He was especially concerned with development of gymnastic programs within school systems. Childhood interest in physical activity sparked Nachtegall's fascination with fitness. Eventually he taught in a private facility, which was devoted entirely to physical training and later became director of a program designed to prepare future fitness instructors called Training Teachers of Gymnastics (4).

England: Within Great Britain, medical student Archibald Maclaren spread the word on the benefits of fitness and regular exercise. Marclaren, like Per Henrik Ling of Sweden, was fascinated in the scientific components of fitness. His lifetime works in these areas are recorded in National Systems of Bodily Exercise and Training in Theory and Practice. Marclaren made several observations based on his work, which are remarkably similar to present-day exercise recommendations. Firstly, Marclaren believed the cure for weariness and stress was physical action. Secondly, he noted recreational exercise found in games and sport was not sufficient for attaining adequate fitness levels. Finally, Marclaren realized both growing boys and girls required regular physical exercise. In agreement with Ling, Marclaren also recognized the need for individual variation in fitness training programs. Furthermore, he documented the importance of progression of exercise (15).

America – Colonial Period (1700-1776); Hardships of colonial life ensured that regular physical activity continued to be a lifestyle priority, however during this period no organized exercise or fitness programs existed. Colonial America remained an undeveloped country characterized by much unexplored land and wilderness. Lifestyles during this era consisted largely of plowing the land for crops, hunting for food, and herding cattle (16). This lifestyle provided sufficient levels of physical activity with no additional need or demand for exercise to maintain fitness levels.

United States - National Period (1776 to 1860):Fitness in the United States during the National Period was influenced by European cultures. Immigrants brought many aspects of their heritage to the United States, including German and Swedish gymnastics. Constant threats to independence and nationalism from foreign invasion were dynamics prevalent in Europe and not the United States. German and Swedish gymnastic programs failed to attain the same levels of popularity as in Europe (9).

However, early leaders in the United States were conscious of the need for exercise and fitness. Benjamin Franklin recommended regular physical activity, including running, swimming, and basic forms of resistance training for health purposes (17). President Thomas Jefferson acknowledged the necessity for fitness, although maybe to a somewhat extreme measure: "Not less than two hours a day should be devoted to exercise, and the weather shall be little regarded. If the body is feeble, the mind will not be strong" (18). Early Physical Education in the United States

Within Europe, schools had been an important medium for spreading the need for fitness to society through physical education programs. However, in the United States, the educational process focused primarily on intellectual matters. Schools concentrated on teaching traditional subjects including reading, writing, and arithmetic. Physical education remained missing from the public education system for the better part of the nineteenth century (15). Despite the relative lack of interest in fitness existing during this era, J.C. Warren and Catherine Beecher made significant contributions to the future of fitness in America.

Dr. J.C. Warren, a medical professor at Harvard University, was a major proponent of physical activity. Warren's medical background gave him a clear understanding of the necessity for regular exercise, with his recommendations including exercises such as gymnastics and calisthenics. Furthermore, Warren began devising exercises for females (5). Catherine Beecher specifically devised fitness programs to meet the needs

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of women. Among her many different programs was a system of calisthenics performed to music (9). Though not formally recognized in name, Beecher's programs of the mid-nineteenth century bear remarkable similarities to modern-day aerobics.

United States – post-Civil War (1865-1900): One of the most important events with respect to modern fitness in the United States was the Industrial Revolution, which resulted in widespread cultural changes throughout the country. Advancement in industrial and mechanical technologies replaced labor-intensive jobs. Rural life changed to an urban lifestyle. The new city life generally required less movement and work compared to rural life, consequently decreasing levels of physical activity.

At the turn of the century, the most common causes of death were from influenza, polio, rubella, and other infectious diseases. Risk of disease and mortality from infectious diseases were alleviated with the discovery of Penicillin. The cost of industrialization and urbanization became glaringly apparent starting in the 1950s and 1960s. An epidemic of hypokinetic diseases including cardiovascular disease, cancer, and Type II diabetes, never before prevalent, began to be recognized as the leading causes of disease and death (19). The lifestyle improvements brought in part by the Industrial Revolution had apparently come with an unwanted and alarming cost to health.

Physical Education: Following the end of the Civil War in 1865, Swedish and German Gymnastics enjoyed a moderate growth in popularity. However, the most popular form of gymnastics during this time period was "The New Gymnastics," introduced by Dioclesian Lewis (20). Individuals who played important roles in the development of fitness during this time period were Edward Hitchcock, William Anderson, and Dudley Sargent. Hitchcock recognized the desired outcome of his fitness programs (combination of gymnastics and calisthenics) was improved health. He also introduced the concept of utilizing anthropometric measurements to assess fitness progress. Sargent added scientific research to fitness instruction and developed organized instructor teaching methodologies. The lifetime work of Anderson focused on physical education instruction, with his greatest contribution being its development into a professional organization (5,9,20). An interesting argument developed during the post-Civil War period that still exists today. Many physical education instructors believed firmly in the value of incorporating exercise programs that would improve health-related fitness. However, sports were also gaining popularity in the United States during this era. Consequently, the majority of physical education programs focused on sports and games. The debate between health-related fitness and skill-related fitness physical education programs continues to exist (9).

The 20th Century: The 20th century symbolized the beginning of a new era of fitness leaders: the Presidents of the United States. Theodore Roosevelt, perhaps the most physically fit President to occupy the oval office, also led the nation into the new century. He recognized the importance of exercise and physical activity, and had the power to encourage the citizens of America to be physically active. President Roosevelt held an infatuation for fitness similar to the ideology of ancient Greece. His desire for physical fitness evolved out of his childhood battle with asthma, which he overcame with a rigorous exercise program. As President, he engaged in multiple forms of physical activity including hiking, horseback riding, and other outdoor endeavors. Although not all the presidents following Roosevelt have held fitness in the same high regard, they recognized that the position required a commitment to the fitness of the citizens of the United States (17).

World War I: In Europe, the First World War started in August of 1914, with the entrance of the United States occurring three years later in 1917. With the United States' entry into the battle, hundreds of thousands of military personnel were drafted and trained for combat. After the war was fought and won, statistics were released from the draft with disturbing data regarding fitness levels. It was found that one out of every three drafted individuals was unfit for combat and many of those drafted were highly unfit prior to military training (5,9). Government legislation was passed that ordered the improvement of physical education programs

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within the public schools. However, the heightened interest and concern for low fitness levels would be short-lived as the United States entered the 1920s and the Depression.

The Roaring Twenties and Great Depression

Heightened interest in fitness dissipated throughout the decade. A pattern that had been familiar throughout history is that after a war is fought and won, the tendency is for society to relax, enjoy life, and exercise less. The Roaring Twenties earned the label for a reason, as society lived more frivolously than at any other time in history. Priorities centered on eating, drinking, partying, and other forms of entertainment (21). In October of 1929, the stock market crashed, signaling the beginning of what would be a decade of economic depression. The economy failed to recover until the United States entered World War II in 1941. Along with many other aspects of life, fitness levels declined during the Depression. The gains that physical education programs made through the passage of legislation following the WW I were short-lived. Funding for these programs became limited and eventually was exhausted as emphasis in the poor economy was forced to shift elsewhere (15,20).

Despite the setbacks which fitness suffered during the Great Depression, Jack LaLanne, who would eventually be recognized as a guiding pioneer of fitness, began his lifetime career as a media fitness instructor. Throughout his life, LaLanne preached the value of preventive lifestyle habits. In the 1950s, The Jack LaLanne Show began airing on television, preceding the appearance of Richard Simmons and Jane Fonda by 25 years. LaLanne developed fitness programs including aerobics, water aerobics, and resistance exercise. He also introduced numerous pieces of exercise equipment including the first cable-pulley machine, the safety system for doing squats called the Smith machine, and the first leg extension machine. Although LaLanne is often referred to as the originator of the "jumping jack movement", history suggests the real inventor was John “Black Jack” Pershing, a tactical officer from West Point in World War I. Though LaLanne preceded the modern fitness movement by some three decades, his fitness ideology and exercise programs were correct in approach when judged by modern research.:

World War II: Throughout world history, military conflicts have had major impacts on the state of fitness. The Second World War and its aftermath in the United States would be no different. Essentially, the modern fitness movement evolved out of the influence of World War II and subsequent development of the Cold War. The United States entered World War II with the bombing of Pearl Harbor on December 7, 1941. With the declaration of war came the necessity to draft military personnel. However, as more men were drafted, it became embarrassingly clear that many of them were not fit for combat. When the war was over, it was reported that nearly half of all draftees needed to be rejected or were given non-combat positions (20). These disturbing statistics helped gain the attention of the country with regards to the importance of fitness. Important contributions to fitness came during the 1940s, specifically from Dr. Thomas K. Cureton at the University of Illinois. Cureton introduced the application of research to fitness, which improved exercise recommendations to individuals. Cureton not only recognized the numerous benefits of regular exercise, he strived to expand the body of knowledge regarding physical fitness. He wanted to answer questions such as how much exercise was healthy and what types of exercise were most effective. More importantly, Cureton wanted to know how physical fitness could best be measured within an individual. Among his most important contributions were developing fitness tests for cardiorespiratory endurance, muscular strength, and flexibility. His research resulted in multiple recommendations for the improvement of cardiorespiratory fitness, including the identification of exercise intensity guidelines necessary for improved fitness levels. His suggestions became the fundamental basis behind future exercise programs (23).

1950s - United States: The Cold War, Baby Boomer era was marked by the development of an important factor influencing the modern fitness movement known as the "Minimum Muscular Fitness Tests in Children" by

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Kraus-Hirschland (24). This study utilized the Kraus-Weber tests to measure muscular strength and flexibility in the trunk and leg muscles. It was reported that close to 60 percent of American children failed at least one of the tests. In comparison, only nine percent of children from European countries failed one of the tests. During the Cold War, these startling numbers launched political leaders into action to promote health and fitness.

When results of the Kraus-Hirschland studies were reported to President Eisenhower by Senators James Kelly and James Duff, he responded by holding a White House Conference in June of 1956. Out of these meetings came two important results: 1) the formation of the President's Council on Youth Fitness and 2) the appointment of the President's Citizens Advisory Committee on the Fitness of American Youth (25). This was an important first step in helping to gain the nation's attention concerning her fitness levels. During the 1950s, numerous organizations took initiative in educating the general public about the consequences of low fitness levels. Several agencies that have been involved in fitness promotion since the mid-1950s include the American Health Association (AHA), the American Medical Association (AMA), the American Association for Physical Education, Recreation, and Dance (AAPHERD), and the President's Council on Youth Fitness (9). These organizations would provide merit and legitimacy to the coming fitness movement. The American College of Sports Medicine (ACSM) was formed in 1954, and has proved to be one of the premier organizations in the promotion of health and fitness to American society and worldwide. Throughout its history, ACSM has established position stands on various exercise-related issues based on scientific research.

1960s - United States;President John F. Kennedy was a major proponent of fitness and its health-related benefits to the American people. He furthered the development of the President's Council on Youth Fitness, appointing Bud Wilkinson as head of the council. The name was also changed to the President's Council on Physical Fitness. Kennedy spoke openly about the need for American citizens to improve their fitness levels, including writing an article in Sports Illustrated entitled "The Soft American." He said, "We are under-exercised as a nation; we look instead of play; we ride instead of walk" (27). Kennedy prompted the federal government to become more involved in national fitness promotion and started youth pilot fitness programs. Kennedy's commitment to fitness can best be summarized when he said, "Physical fitness is the basis for all other forms of excellence." (28)

Dr. Ken H. Cooper, widely recognized as "The Father of the Modern Fitness Movement", is generally credited with encouraging more individuals to exercise than any other individual in history. Cooper advocated a philosophy that shifted away from disease treatment to one of disease prevention. "It is easier to maintain good health through proper exercise, diet, and emotional balance than it is to regain it once it is lost" he said. Early in his career, Cooper stressed the necessity for providing epidemiological data to support the benefits of regular exercise and health. Data from thousands of individuals became the foundation for his aerobic concepts. Aerobics, released in 1968, sent a powerful message to the American people - to prevent the development of chronic diseases, exercise regularly and maintain high fitness levels throughout life (29). Dr. Cooper's message, programs and ideas established the model from which fitness has proliferated up to modern time.

Lessons from History: The history of fitness portrays some fascinating themes that relate closely to the 21st century. One commonality is the strong association of military and political might with physical fitness throughout mankind's advancement. In many ways, this shows how impacting our world leaders can be on health and fitness.

The mind-body concept has had a tenuous development. At times, some cultures prescribed spirituality at the expense of the body where as others, such as Greek society, upheld the ideal a sound mind can only be found in a healthy body.

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Another interesting development from history is the concept of exercise for the body and music for the soul. Present day fitness programs have evolved this concept harmoniously, with music being a distinctive component to the exercise experience.

It appears that as societies become too enamored with wealth, prosperity and self-entertainment that fitness levels drop. In addition, as technology has advanced with man, the levels of physical fitness have decreased. History offers little insight how to prevent or turnaround these recourses. Thus, this is a resolution we are challenged with in today's society. Perhaps utilizing all of the extensive research completed on health and fitness in combination with the creative minds now in the fitness industry, we now can solve this part of the fitness puzzle.

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FITNESS & WELLNESS THROUGH SPORTS
(Introduction – Physical Fitness – Health - Wellness)

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INTRODUCTION

Physical Fitness is the capacity to carry out responsible vigorous physical activity and includes qualities in pertain to the individual health and well being. Sports training largely depend on Physical Fitness. Physical Fitness improves the general fitness, health, organic functioning capacity, strength, stability of muscular and skeleton system etc.

Importance of Physical Fitness or motor abilities is the main criteria in sports training. As per **Sebastian Coe -** says that, the basis for overall physical fitness is achieved by improving your respiration and your circulation, and to the end the most effective activity is running. The longer you keep running and exercise well the longer you will stay well.

Physical Fitness is the basic criteria for every individual in the society. To lead a successful life an individual has to undergo fitness programmes in his daily life. It is an important programme for sportsman. Through fitness a sportsman easily adapts motor abilities and conditioning.

Sports specialists traditionally define the term fitness as a physical capacity to perform a task. The types of physical capacities necessary to participate in a sporting contest vary between sports and within sports. From the many components of physical fitness most sports are mainly concentrated with strength, speed, endurance, flexibility and co-ordination.

Meaning: The ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure time activities and meeting emergency demands. It is the ability to endure, to hear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well being.

Physical Fitness:

- Fitness is the total functional capacity (adaptation of various systems of the body) to perform a specific task.
- Ability to carry our reasonably vigorous physical activities involving muscular strength, muscle endurance, cardio-respiratory endurance and flexibility.
- Fitness is the state which characterizes the degree to which a person is able to function efficiently. Fitness is an individual matter; it implies the ability of each person to live most efficiently with in his potentialities.
- Physical fitness is the capacity to carry out responsible vigorous physical activity and included qualities in pertain to the individual health and well-being.

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- "Physical fitness is the ability to carry out daily task with vigor and alertness, without undue fatigue, and with ample energy to engage in leisure pursuits and to meet emergency situations". **– Harrison Clark.**
- "Physical fitness refers to the organic capacity of the individual to perform the normal task of daily living without undue tiredness or fatigue having reserves of strength and energy available to meet satisfactorily any emergency demands suddenly placed upon him." **– Nixon.**

Importance of Physical Fitness:

Physical fitness is the fine tuning of the human body or engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel and do our best.

Improve health

- Increase efficiency of heart and lungs.
- Reduce cholesterol level.
- Increase muscle strength.
- Reduce Blood pressure
- Reduce risk of major illness such as diabetes and heart diseases
- Weight loss.

Improve sense of well-being

- More energy
- Less stress
- Improved qualities of sleep
- Improved ability to cope with stress.
- Increased mental sharpness.

Improved appearance

- Weight loss
- Toned muscle
- Improved posture

Enhance Social Life

- Improved self-image
- Increased opportunities to make new friends
- Increased opportunities to share an activity with friends and family member.

Increased capacities

- Increased systems functioning capacity.
- Increased resistance power.
- Improves cardiac health.
- Keeps body joint lubricated.
- Improves muscle mass and muscle tone.
- Reduce the chance of having heart diseases.
- Help to control glucose level in the diabetic person's.
- Improves the balance of the body, which minimizes the risk.
- Improves Neuro-muscular co-ordination.

Health:

- The state of not having any illnesses.

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- It is “A state of complete physical, mental, and social well being, and not merely the absence of disease or infirmity." Health is a dynamic condition resulting from a body's constant adjustment and adaptation in response to stresses and changes in the environment for maintaining an inner equilibrium called homeostasis”. - **World Health Organization (WHO).**

Wellness:

- "A conscious, self-directed and evolving process of achieving full potential." - **The National Wellness Institute.**
- *Wellness is an active process of becoming aware of and making choices toward a healthy and fulfilling life.*
- *Maintaining an optimal level of wellness is absolutely crucial to live a higher quality life. Wellness matters. Wellness matters because everything we do and every emotion we feel relates to our well-being. In turn, our well-being directly affects our actions and emotions. It’s an ongoing circle. Therefore, it is important for everyone to achieve optimal wellness in order to subdue stress, reduce the risk of illness and ensure positive interactions.*
- **Emotional Wellness**
  Emotional wellness inspires self-care, relaxation, stress reduction and the development of inner strength. It is important to be attentive to both positive and negative feelings and be able to understand how to handle these emotions. Emotional wellness also includes the ability to learn and grow from experiences. Emotional well-being encourages autonomy and proper decision making skills. It is an important part of overall wellness.
- Environmental Wellness
  Environmental wellness inspires us to live a lifestyle that is respectful of our surroundings. This encourages us to live in harmony with the Earth by taking action to protect it. Environmental well-being promotes interaction with nature and your personal environment. Everyone can have a strong environmental conscious simply by raising their awareness.
- Intellectual Wellness
  Intellectual wellness encourages us to engage in creative and mentally-stimulating activities. These activities should expand your knowledge and skills while allowing you to share your knowledge and skills with others. Intellectual wellness can be developed through academics, cultural involvement, community involvement and personal hobbies. As intellectual wellness develops, you are able to develop personal resources that work together with the other realms of wellness in order to be achieve a more balanced life.
- Occupational Wellness
  Occupational wellness inspires us to prepare for work in which we will gain personal satisfaction and find enrichment in our life. Your attitude about work is a crucial influence for occupational development. Occupational wellness allows you to explore various career options and encourages you to pursue the opportunities you enjoy the most. This dimension of wellness recognizes the importance of satisfaction, enrichment and meaning through work.
- Physical Wellness
  Physical wellness promotes proper care of our bodies for optimal health and functioning. There are many elements of physical wellness that all must be cared for together. Overall physical wellness encourages the balance of physical activity, nutrition and mental well-being to keep your body in top condition. Obtaining an optimal level of physical wellness allows you to nurture personal

responsibility for your own health. As you become conscious of your physical health, you are able to identify elements you are successful in as well as elements you would like to improve.

- Social Wellness

  Social wellness refers to the relationships we have and how we interact with others. Our relationships can offer support during difficult times. Social wellness involves building healthy, nurturing and supportive relationships as well as fostering a genuine connection with those around you. Conscious actions are important in learning how to balance your social life with your academic and professional lives. Social wellness also includes balancing the unique needs of romantic relationships with other parts of your life.

- Spiritual Wellness

  Spiritual wellness allows us to be in tune with our spiritual selves. This realm of wellness lets us find meaning in life events and define our individual purpose. Spiritual wellness can be defined through various factors including religious faith, values, ethics and morals. Regardless of whether you believe in a particular religious faith, there is always something to be learned about how you see yourself in the world.

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STRESS MANAGEMENT AND RELAXATION TECHNIQUES

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Stress- you hear this word everywhere these days; from senior citizens to adults; even it is not uncommon to spot stress in children. Well, what is stress? Simply put, stress is the reaction of the body to everyday pressure and tension. Besides, it gives a feel of being unhealthy all the times.

Symptoms of Stress and Effects of Stress on Health

Obviously stress affects the emotions first and causes psychological symptoms. Early symptoms of stress may include anxiousness, distraction, nervousness, excessive worry, changes in sleep patterns, irritability, anger, depression, intolerance, thought of hurting self or others, palpitation, stress headache and internal pressure.

These emotional situations slowly start affecting a person's external appearance. The person affected may seem self-absorbed, distracted, angry or irritable, and unusually nervous or anxious.

Now, as the level of stress ascends or if it lasts for a longer period of time, the individual may start experiencing severe physical symptoms like: headaches, excessive fatigue, nausea and vomiting, diarrhoea, tachycardia, chest pain, high blood pressure, flushing or dizziness, shortness of breath, restlessness, choking sensation or hyperventilation.

What is stress management?

Stress management is all about taking charge: of your lifestyle, thoughts, emotions, and the way you deal with problems. No matter how stressful your life seems, there are steps you can take to relieve the pressure and regain control.

We all respond to stress differently so, there's no "one size fits all" solution to managing stress. But if you feel like the stress in your life is out of control, it's time to take action. Stress management can teach you healthier ways to cope with stress, help you reduce its harmful effects, and prevent stress from spiralling out of control again in the future.

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How do you currently cope with stress?

Think about the ways currently manage and cope with stress in your life. Are your coping strategies healthy or unhealthy, helpful or unproductive? Unfortunately, many people cope with stress in ways that compound the problem.

Unhealthy ways of coping with stress

These coping strategies may temporarily reduce stress, but they cause more damage in the long run:

- Smoking
- **Drinking too much**
- Bingeing on junk or comfort food
- **Zoning out for hours in front of the TV or computer**
- Withdrawing from friends, family, and activities
- **Using pills or drugs to relax**
- Sleeping too much
- Procrastinating
- Filling up every minute of the day to avoid facing problems
- Taking out your stress on others (lashing out, angry outbursts, physical violence)

Stress management strategy 1: Get moving

Physical activity plays a key role in reducing and preventing the effects of stress, but you don't have to be an athlete or spend hours in a gym to experience the benefits. Just about any form of physical activity can help relieve stress and burn away anger, tension, and frustration. Exercise releases endorphins that boost your mood and make you feel good, and it can also serve as a valuable distraction to your daily worries.

The first step is to get yourself up and moving. Here are a few easy ways:

- Put on some music and dance around
- Take your dog for a walk
- Walk or cycle to the grocery store
- Use the stairs at home or work rather than an elevator
- Park your car in the farthest spot in the lot and walk the rest of the way
- Pair up with an exercise partner and encourage each other as you workout
- Play Ping-Pong or an activity-based video game with your kids

Managing stress with regular exercise

Once you're in the habit of being physically active, try to incorporate regular exercise into your daily schedule. Activities that are continuous and rhythmic—and require moving both your arms and your legs—are especially effective at relieving stress. Walking, running, swimming, dancing, cycling, tai chi, and aerobic classes are good choices.

When you've exercised, you'll likely find it easier to put other stress management techniques to use, including reaching out to others and engaging socially.

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Stress management strategy 2: Engage socially

- Reach out and build relationships
- Reach out to a colleague at work
- Help someone else by volunteering
- Have lunch or coffee with a friend
- Ask a loved one to check in with you regularly
- Accompany someone to the movies or a concert
- Call or email an old friend
- Go for a walk with a workout buddy
- Schedule a weekly dinner date
- Meet new people by taking a class or joining a club

Social engagement is the quickest, most efficient way to rein in stress and avoid overreacting to internal or external events that you perceive as threatening. There is nothing more calming to your nervous system than communicating with another human being who makes you feel safe and understood. This experience of safety—as perceived by your nervous system—results from nonverbal cues that you hear, see and feel.

Stress management strategy 3: Avoid unnecessary stress

While stress is an automatic response from your nervous system, some stressors arise at predictable times—your commute to work, a meeting with your boss, or family gatherings, for example. When handling such predictable stressors, you can either change the situation or change your reaction. When deciding which option to choose in any given scenario, it's helpful to think of the four A's: avoid, alter, adapt, or accept.

Avoid the stressor

It's not healthy to avoid a stressful situation that needs to be addressed, but you may be surprised by the number of stressors in your life that you can eliminate.

- **Learn how to say "no"** – Know your limits and stick to them. Whether in your personal or professional life, taking on more than you can handle is a sure-fire recipe for stress. Distinguish between the "should" and the "musts" and, when possible, say "no" to taking on too much.
- **Avoid people who stress you out** – If someone consistently causes stress in your life, limit the amount of time you spend with that person, or end the relationship.
- **Take control of your environment** – If the evening news makes you anxious, turn off the TV. If traffic makes you tense, take a longer but less-travelled route. If going to the market is an unpleasant chore, do your grocery shopping online.

Stress management strategy 4: Alter the situation

If you can't avoid a stressful situation, try to alter it. Often, this involves changing the way you communicate and operate in your daily life.

- **Express your feelings instead of bottling them up.** If something or someone is bothering you, be more assertive and communicate your concerns in an open and respectful way.

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- **Be willing to compromise.** When you ask someone to change their behaviour, be willing to do the same. If you both are willing to bend at least a little, you'll have a good chance of finding a happy middle ground.
- **Manage your time better.** Poor time management can cause a lot of stress. But if you plan ahead and make sure you don't overextend yourself, you'll find it easier to stay calm and focused.

Stress management strategy 5: Adapt to the stressor

How you think can have a profound effect on your stress levels. Each time you think a negative thought about yourself, your body reacts as if it were in the throes of a tension-filled situation. Regain your sense of control by changing your expectations and attitude to stressful situations.

- **Reframe problems.** Try to view stressful situations from a more positive perspective. Rather than fuming about a traffic jam, look at it as an opportunity to pause and regroup, listen to your favourite radio station, or enjoy some alone time.
- **Look at the big picture.** Take perspective of the stressful situation. Ask yourself how important it will be in the long run. Will it matter in a month? A year? Is it really worth getting upset over? If the answer is no, focus your time and energy elsewhere.
- **Adjust your standards.** Perfectionism is a major source of avoidable stress. Stop setting yourself up for failure by demanding perfection. Set reasonable standards for yourself and others, and learn to be okay with "good enough."

Stress management strategy 6: Accept the things you can't change

Many sources of stress are unavoidable. You can't prevent or change stressors, such as the death of a loved one, a serious illness, or a national recession. In such cases, the best way to cope with stress is to accept things as they are. Acceptance may be difficult, but in the long run, it's easier than railing against a situation you can't change.

- **Don't try to control the uncontrollable.** Many things in life are beyond our control—particularly the behaviour of other people. Rather than stressing out over them, focus on the things you can control such as the way you choose to react to problems.
- **Look for the upside.** When facing major challenges, try to look at them as opportunities for personal growth. If your own poor choices contributed to a stressful situation, reflect on them and learn from your mistakes.
- **Learn to forgive.** Accept the fact that we live in an imperfect world and that people make mistakes. Let go of anger and resentments. Free yourself from negative energy by forgiving and moving on.

Stress management strategy 7: Make time for fun and relaxation

Beyond a take-charge approach and a positive attitude, you can reduce stress in your life by nurturing yourself. If you regularly make time for fun and relaxation, you'll be in a better place to handle life's stressors.

Develop a "stress relief toolbox"

Come up with a list of healthy ways to relax and recharge. Try to implement one or more of these ideas each day, even if you're feeling good.

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- Go for a walk
- Spend time in nature
- Call a good friend
- Play a competitive game of tennis or racquetball
- Write in your journal
- Take a long bath
- Light scented candles
- Savor a warm cup of coffee or tea
- Play with a pet
- Work in your garden
- Get a massage
- Curl up with a good book
- Listen to music
- Watch a comedy

Stress management strategy 8: Adopt a healthy lifestyle

In addition to regular exercise, there are other healthy lifestyle choices that can increase your resistance to stress.

- **Eat a healthy diet.** Well-nourished bodies are better prepared to cope with stress, so be mindful of what you eat. Start your day right with breakfast, and keep your energy up and your mind clear with balanced, nutritious meals throughout the day.
- **Reduce caffeine and sugar.** The temporary "highs" caffeine and sugar provide often end in with a crash in mood and energy. By reducing the amount of coffee, soft drinks, chocolate, and sugar snacks in your diet, you'll feel more relaxed and you'll sleep better.
- **Avoid alcohol, cigarettes, and drugs.** Self-medicating with alcohol or drugs may provide an easy escape from stress, but the relief is only temporary. Don't avoid or mask the issue at hand; deal with problems head on and with a clear mind.
- **Get enough sleep.** Adequate sleep fuels your mind, as well as your body. Feeling tired will increase your stress because it may cause you to think irrationally.

Relaxation Techniques for Stress Relief

For many of us, relaxation means zoning out in front of the TV at the end of a stressful day. But this does little to reduce the damaging effects of stress. To effectively combat stress, we need to activate the body's natural relaxation response.

Relaxation technique 1: Breathing meditation for stress relief

With its focus on full, cleansing breaths, deep breathing is a simple yet powerful relaxation technique. It's easy to learn, can be practiced almost anywhere, and provides a quick way to get your stress levels in check. Deep breathing is the cornerstone of many other relaxation practices, too, and can be combined with other relaxing elements such as aromatherapy and music. All you really need is a few minutes and a place to stretch out.

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Practicing deep breathing meditation

The key to deep breathing is to breathe deeply from the abdomen, getting as much fresh air as possible in your lungs. When you take deep breaths from the abdomen, rather than shallow breaths from your upper chest, you inhale more oxygen. The more oxygen you get, the less tense, short of breath, and anxious you feel.

- Sit comfortably with your back straight. Put one hand on your chest and the other on your stomach.
- Breathe in through your nose. The hand on your stomach should rise. The hand on your chest should move very little.
- Exhale through your mouth, pushing out as much air as you can while contracting your abdominal muscles. The hand on your stomach should move in as you exhale, but your other hand should move very little.
- Continue to breathe in through your nose and out through your mouth. Try to inhale enough so that your lower abdomen rises and falls. Count slowly as you exhale.

If you find it difficult breathing from your abdomen while sitting up, try lying on the floor. Put a small book on your stomach, and try to breathe so that the book rises as you inhale and falls as you exhale. Breathing techniques can be practiced almost anywhere and can be combined with other relaxation exercises, such as aromatherapy and music. All you really need is a few minutes and a place to stretch out.

Relaxation technique 2: Rhythmic movement for stress relief

Rhythmic exercise or physical activity that engages both your arms and legs—such as running, walking, swimming, dancing, rowing, or climbing—is most effective at relieving stress when performed mindfully. As with meditation, mindfulness requires being fully engaged in the present moment, focusing your mind on how your body feels right now. As you move, instead of continuing to focus on your thoughts, focus on the sensations in your limbs and how your breathing complements your movement. If your mind wanders to other thoughts, gently return to focusing on your breathing and movement.

If walking or running, for example, focus on each step—the sensation of your feet touching the ground, the rhythm of your breath while moving, and the feeling of the wind against your face. If you've experienced trauma, adding this mindfulness element can help your nervous system become "unstuck" and move on.

Relaxation technique 3: Rhythmic movement for stress relief

Progressive muscle relaxation involves a two-step process in which you systematically tense and relax different muscle groups in the body.

With regular practice, progressive muscle relaxation gives you an intimate familiarity with what tension—as well as complete relaxation—feels like in different parts of the body. This awareness helps you spot and counteract the first signs of the muscular tension that accompanies stress. And as your body relaxes,

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so will your mind. You can combine deep breathing with progressive muscle relaxation for an additional level of stress relief.

Practicing progressive muscle relaxation

Progressive muscle relaxation sequence

Right foot, then left footRight calf, then left calf
Right thigh, then left thighHips and buttocks
Stomach Chest
BackRight arm and hand, then left arm and hand
Neck and shouldersFace

Before practicing progressive muscle relaxation, consult with your doctor if you have a history of muscle spasms, back problems, or other serious injuries that may be aggravated by tensing muscles.

Relaxation technique 4: Mindful meditation for stress relief

Mindfulness is the ability to remain aware of how you're feeling right now, your "moment-to-moment" experience—both internal and external. Thinking about the past—blaming and judging yourself—or worrying about the future can generate stress. But by staying calm and focused in the present moment, you can bring your nervous system back into balance. Mindfulness can be applied to activities such as walking, exercising, eating, or meditation.

Meditations that cultivate mindfulness have long been used to reduce stress, anxiety, depression, and other negative emotions. Some of these meditations bring you into the present by focusing your attention on a single repetitive action, such as your breathing, a few repeated words, or the flickering light of a candle. Other forms of mindfulness meditation encourage you to follow and then release internal thoughts or sensations.

Relaxation technique5: Visualization meditation for stress relief

Visualization, or guided imagery, is a variation on traditional meditation that requires you to employ not only your visual sense, but also your sense of taste, touch, smell, and hearing. When used as a relaxation technique, visualization involves imagining a scene in which you feel at peace, free to let go of all tension and anxiety.

Choose whatever setting is most calming to you, whether it's a tropical beach, a favourite childhood spot, or a quiet wooded glen. You can do this visualization exercise on your own in silence, while listening to soothing music, or with a therapist (or an audio recording of a therapist) guiding you through the imagery. To help you employ your hearing you can use a sound machine or download sounds that match your chosen setting—the sound of ocean waves if you've chosen a beach, for example.

Relaxation technique 6: Yoga for stress relief

Yoga involves a series of both moving and stationary poses, combined with deep breathing. As well as reducing anxiety and stress, yoga can also improve flexibility, strength, balance, and stamina. Practiced regularly, it can also strengthen the relaxation response in your daily life. Since injuries can happen when yoga is practiced incorrectly, it's best to learn by attending group classes, hiring a private teacher, or at least following video instructions.

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What type of yoga is best for stress?

Although almost all yoga classes end in a relaxation pose, classes that emphasize slow, steady movement, deep breathing, and gentle stretching are best for stress relief.

- Satyananda is a traditional form of yoga. It features gentle poses, deep relaxation, and meditation, making it suitable for beginners as well as anyone primarily looking for stress reduction.
- Hatha yoga is also reasonably gentle way to relieve stress and is suitable for beginners. Alternately, look for labels like gentle, for stress relief, or for beginners when selecting a yoga class.
- Power yoga, with its intense poses and focus on fitness, is better suited to those looking for stimulation as well as relaxation.

Relaxation technique 7: Massage therapy for stress relief

You're probably already aware how much a professional massage at a spa or health club can help reduce stress, relieve pain, and ease muscle tension. What you may not be aware of is that you can experience many of the same benefits at home or work by practicing self-massage—or trading massages with a loved one. Try taking a few minutes to massage yourself at your desk between tasks, on the couch at the end of a hectic day, or in bed to help you unwind before sleep. To enhance relaxation, you can use aromatic oil, scented lotion, or combine self-message with mindfulness or deep breathing techniques.

A five-minute self-massage to relieve stress

A combination of strokes works well to relieve muscle tension. Try gentle chops with the edge of your hands or tapping with fingers or cupped palms. Put fingertip pressure on muscle knots. Knead across muscles, and try long, light, gliding strokes. You can apply these strokes to any part of the body that falls easily within your reach. For a short session like this, try focusing on your neck and head:

- Start by kneading the muscles at the back of your neck and shoulders. Make a loose fist and drum swiftly up and down the sides and back of your neck. Next, use your thumbs to work tiny circles around the base of your skull. Slowly massage the rest of your scalp with your fingertips. Then tap your fingers against your scalp, moving from the front to the back and then over the sides.
- Now massage your face. Make a series of tiny circles with your thumbs or fingertips. Pay particular attention to your temples, forehead, and jaw muscles. Use your middle fingers to massage the bridge of your nose and work outward over your eyebrows to your temples.
- Finally, close your eyes. Cup your hands loosely over your face and inhale and exhale easily for a short while.

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APPLICATION OF PSYCHOLOGY IN PHYSICAL EDUCATION AND SPORTS

Dr. SUNDAR RAJ URS

Meaning and Definition

Sport psychology is the scientific study of people and their behaviors in sport contexts and the practical application of that knowledge.

- Sport psychologists identify principles and guidelines that professionals can use to help adults and children participate in and benefit from sport and exercise activities in both team and individual environments.
- Sport psychologists have two objectives in mind:
  - to understand how psychological factors affect an individual's physical performance
  - to understand how participation in sport and exercise affects a person's psychological development, health and well-being.
- Sport psychology deals with increasing performance by managing emotions and minimizing the psychological effects of injury and poor performance.
- Some of the most important skills taught are goal setting, relaxation, visualization, self-talk, awareness and control, concentration, confidence, using rituals, attribution training, and periodization.
- Teaching: Many trained sport psychologists are expected to teach in their chosen field, whether it be at a tertiary level or teaching an intern in the field of psychology. This is so the skill is passed on and sport psychology remains strong around the world.
- Consulting: The consulting process is very important as one has to consult with individual athletes or team athletes to derive skills to enhance performance levels. Some sport and exercise psychologists work in the fitness industry to design exercise programs that maximize participation and promote psychological well-being.

The History of Sport Psychology

- The history of sport psychology dates back to the late 1800s and from there has grown in to a scientific phenomenon to enhance the performance of individuals in the area of sport. The history of sport psychology falls into six periods, they are;
- **Period 1: The Early years (1895-1920),**
- **Period 2: The Griffith Era (1921-1938),**
- **Period 3: Preparation for the Future (1939-1965),**
- **Period 4: the Establishment of Academic Sport psychology (1966-1977),**
- **Period 5: Multidisciplinary Science and Practice in Sport and Exercise Psychology (1978-2000),**
- **Period 6: Contemporary Sport and Exercise Psychology (2000-Present).**

Sport and Exercise Psychology

- Today, sport and exercise psychologists have begun to research and provide information in the ways that psychological well-being and vigorous physical activity are related.

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- This idea of psychophysiology, monitoring brain activity during exercise has aided in this research. Also, sport psychologists are beginning to consider exercise to be a therapeutic addition to healthy mental adjustment.
- Just recently have sport psychologists begun to be recognized for the valuable contributions they make in assisting athletes and their coaches in improving performance during competitive situations.
- Understanding how physical exercise may contribute to the psychological well-being of non-athletes.
- Many can benefit from sport psychologists:
  a) athletes who are trying to improve their performance,
  b) injured athletes who are looking for motivation,
  c) individuals looking to overcome the pressure of competition,
  d) young children involved in youth sports as well as their parents.
- Special focus is geared towards psychological assessment of athletes. Assessment can be both, focused on selection of athletes and the team set up of rosters as well as on professional guidance and counseling of single athletes.

Psychological Skills Training

- Psychological skills training (PST) refers to consistent practice of mental or psychological skills. Coaches and athletes know that physical skills need to be regularly practiced to become better. Similar to physical skills, psychological skills such as maintaining concentration and regulating arousal levels also need to be practiced. Psychological skills training programmes are very common but not limited to the sporting arena. These PST programmes should be planned, implemented and supervised by a trained sport psychologist.

Why is Psychological Skills Training Important?

- All sport and exercise participants fall victim to mistakes and mental letdowns.
- Mental and emotional components often overshadow the purely physical and technical aspects of the performance.
- To overcome this, one must become equally fit both mentally and physically.
- An individual's success or failure in the sport and exercise arena lies in the ability of the individual to practice both physical and mental skills.

PHYSICAL EDUCATION IN THE NEW MILLENNIUM

- Modern Society in the new millennium has envisaged drastic changes in the entire life style of the populace.
- These changes have not only been restricted to any specific field of life but could be seen in all walks of life.
- Academic impetus during the schooling and the Career impetus while one is on a job emphasize on mental activities subjecting the person to stress and strain thereby affecting the mental health and ability to function at the optimum level irrespective of whether one is a student or a worker.
- A cursory analysis of student's daily activities shows an overload of mental activities and even on the selected physical activities time urgency is of primary concern.
- This had led to a fall in the optimum potential of the student in his activity.
- Examination Anxiety, Social isolation, etc. affects the mental health of the student.
- The story is not different even after schooling. The cozy work environment, user-friendly technology, makes individuals to strive towards career growth overlooking the health. Stress related problems are one of the most important concerns of the management.

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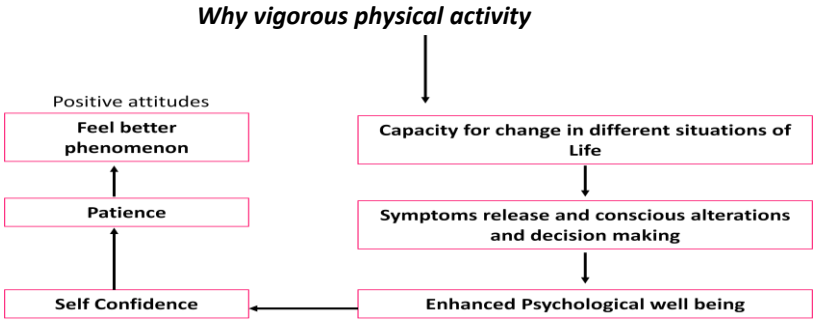
- Lack of appropriate physical activities, ignorance of health related knowledge could be the factors that lead to the above.

PSYCHOLOGICAL APPLICATIONS

- Psychological studies are aimed at establishing body mind relationship and emphasize that sound body leads to sound mind. Results of these studies are useful in enhancing the physical performance of the sports person and also the use of physical activities in the therapy.

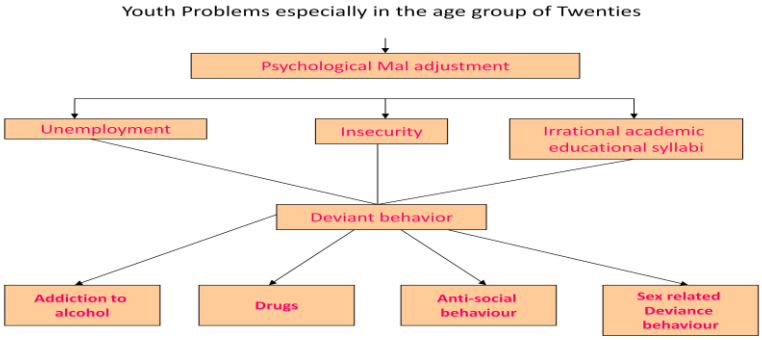
Psychological application in Physical Education

The studies conducted Griest, Klien Faris, German and Margon



The study conducted by Sachs and Paragam have noticed that withdrawals from regular exercises and running can be easily noted through symptoms such as

Mukesh Ambani one of Asia's richest Businessmen – Regular 14 miles jogging



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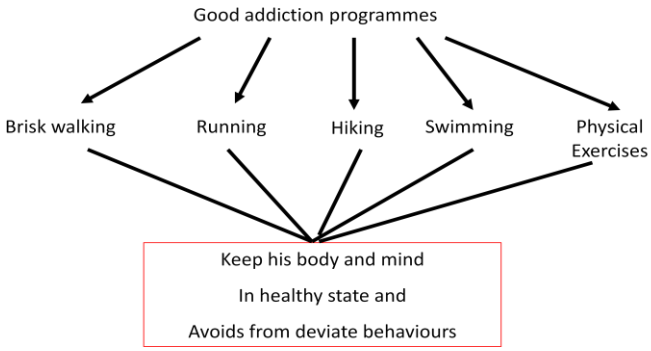
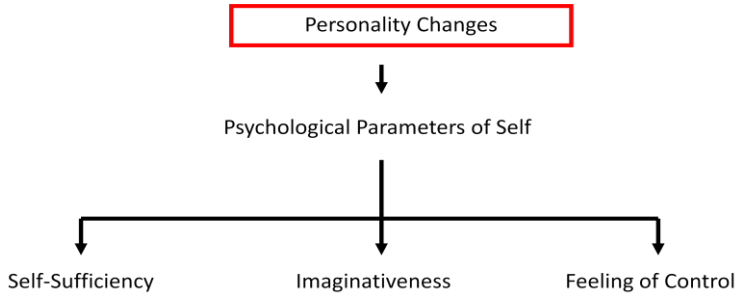
For the above said problems diagnosis at individual level may not be possible. Hence treatment would also not be sought



- A recent meta-analytic review of published and unpublished studies conducted with children and adolescents suggest that exercise training improved cognition in children (Sibley and Etnier 2003) (Research Anatraoly Vol.78, No.5, Pp.510-519). Predicts that the largest improvements in Cognition due to exercise will be on executive function ability to plan and initiate and carry out the activity sequences that make up goal directed behaviour, self monitories s and self control.
- The study conducted by Katzmargy Church and Blair-2004, established a great level of relationship between exercise and 'life style' – the study proved that the lack of physical exercises of activity leads to significant health threat, low level of physical activity have been associate with higher insistences of all can be Mobility and Mortality (Death) particularly with life style disease, including ceremony leant disease and type diabetes.

Exercises leading to Psychological well-being



- The research conducted by the Dienseber and his colleagues at the University of Nebraska, have revealed the significant implication of our thinking in this area.
- Psychological system involved aerobic exercises and in the experience of emotional states are frequently the same. Running may therefore be expected to have an impact on short term emotional functioning and temperament.
- Running may stimulate the development of the capacity of the sympathetic nervous system and associated glandular responses in term.
- This increased psychological capacity may be the major course for indication of reduced emotinal tension in both state and trait studies, as well as the major cause of reduced anxiety.

Exercise as a Therapy

- A Safe Psychotherapatic tool.
- Running Therapy leads to removal of Phobia.

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- A general treatment for depression and anxiety.
- Counselling and Psychotherapy - Physical Exercises
  - Running and Brisk walking
- Research in the field of psychological and behavioural medicine have began experimentally established the fact that mind can effect the body.
- This can be noted from psychosomatic disorders as migraine, headache, Peptic wear, hypertension, bronchitic asthama and sexual impotence.
- It is also becoming evident that the body appropriately utilize, can affect the mind in constructive ways.

Thus physical and psychological changes occur when an individual exercise at 75 to 80% of his or her maximum cardiac output for 30 minutes at least 4 or 5 times a week, Burger-1984

- The research work of Burger suggests that the changes includes improved mood, self-esteem, and work performance as well as increased cardiovascular endurance and improvements in muscle tone, digestion, and blood volume. The research also suggested that the prescribed exercise must be strenuous in order to produce significant psychological change.
- A review of the present youth problems especially in the age group of twenties, depict a good lot of psychological maladjustment and related problems.

CONCLUSION

- The felling of runners high may be obtained through proper guidance by the physical educators by way of brisk walking or running in a cool, calm whether with low humidity.
- Physical well-being and health, (both physical and mental) needs to be encouraged simultaneously.
- Proper orientations is required to the researchers and academicians towards the need for changing the attitude of negative or neutral feeling, towards physical education to positive feelings.

I would like to emphasize by a saying “Save Life Through Physical Activities

SUGGESTED MEASURES

- At the School Level Physical Education should not be restricted to only sports and games.
- Emphasis should be not only on winning but participating and educating the benefits out of the physical activities.
- Theoretical inputs about health, fitness, wellbeing should be inculcated right from the elementary level.
- Periodic feedback about the physical fitness and health of the student should be made available to the parents through proper medical examinations from the competent persons.
- Interest and talents among the students need to be tapped at the earliest and the free periods, vacations etc. to be utilized to strengthen the potentials.
- Physical education should help in developing a positive health attitude, which need to be adopted in one’s later life.
- At the Adult Level: Recreational facilities provided by the employer should include scope for rigorous physical activities.
- Stress management strategies in terms of breathing exercises, relaxation techniques, meditation etc. should be integrated within one’s work life.
- Orientation towards the mal effects of unhealthy food habits, substance abuses like smoking alcohol are to be provided periodically at the work place.

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Professional approach to sports management

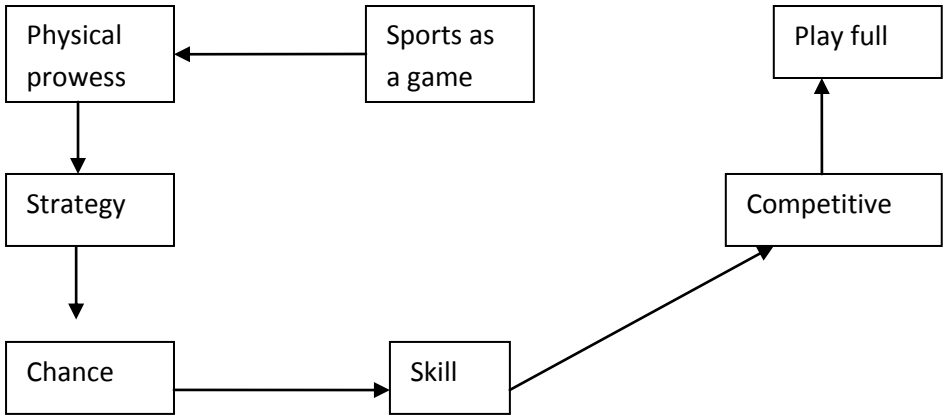
Introduction: Participation in games and sports is a social phenomenon, the social changes, concepts, ideals, interests, and priorities play a dominant role in the sporting interest of the society Social status, values respectability, rewards, honors and finally the opportunities determine the propogalism and practice of sports and games in a social situation.

Sports: It comes from the word disport- meaning 'carrying away from work'. When we think about sports. We think of pleasure only. Now a day's sports is a wide term which includes - games athletics, gymnastics and swimming

Games: Where the movement of the body change from one action to another action, as in case of games like Kho-Kho, Football, Kabaddi, Hockey, Basketball, etc.

In these games all of a sudden certain movements are done to outwit the opponent. They are quick, more elaborate organization and strategies based on intense competition.

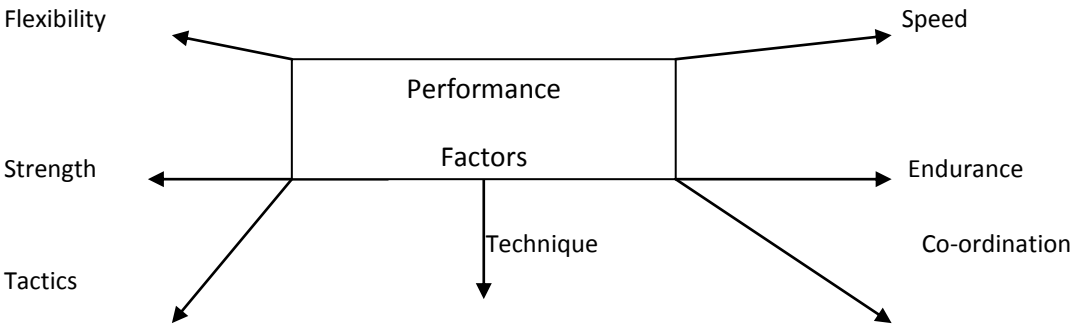
SPORTS IN A CIVIC SOCIETY HAS A DEFINITE ROLE TO PLAY



The present scenario depicts some important things which need immediate attention. The students studying in pre-university colleges are deprived from organized sport competitions. After being in the school for a couple of years, practicing and playing in school games and sports competition. Entry into the Pre-university colleges takes away their aspirations and enthusiasm.

The students of this age group badly require a playfull experience to get away from tension and stress apart from academic pressure. They must be given lot of opportunity to continue the practice and play the game which they have selected in the previous years and take part in competitions. Two years of detraining and not-participation will bring down their physical condition and technical perfection to a very low level. This adds to their dull and lazy life to quite a competitive game.

Performance depends upon the optimum development of all these factors mentions below:



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Need for the sports management:

Management is the co-ordination of the efforts of different people toward a common end.

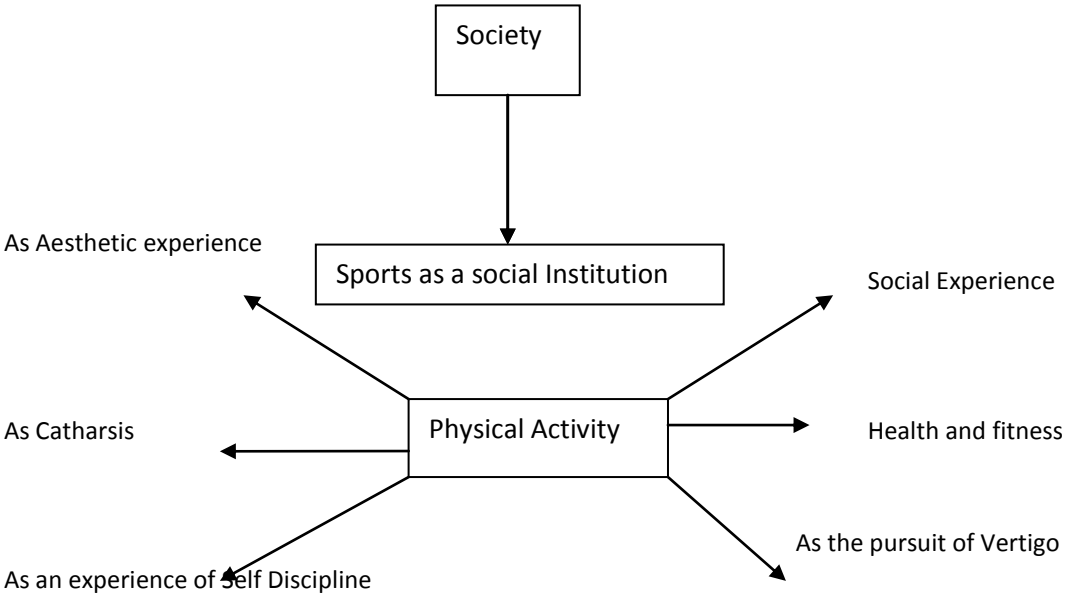
Robins defines it as "The Universal process of efficiently getting activities completed with and through other people".

Dr. Sohan D. Millat opines "Administration is a team of operation to attain a goal" This lead the word administration synonymous to management.

The basic frame works for effective management are:

1) Philosophy
2) Aims and Objectives
3) Policies and procedures
4) Functions

The professional Sports management should aim at:



Philosophy of sports management: Sports mangers need a philosophy; a foundation to base their thinking a sound philosophy provides a better understanding and gives a direction for the manager as he or she in the world of sports management.

Managers must be professional ethical and moral, with fundamental beliefs and values to sport management.

1) Aims and objective: The Organization must have an "Aim" an Aim is a broad, general, remote and desired result for which the professionalist than to strive. For ex: increasing the mass participation in games and sports to achieve this the steps that are followed are called objectives, to achieve the above aim the objectives are enhancement of playing fields, equipment, personals.

2) Policies and procedures: A policy is a statement of prudent course of action adopted and pursued by an organization procedures carry out the policies, policies are the course of action or the guide lines which procedures are methods of implementation.

The status of sports and games in sports management:

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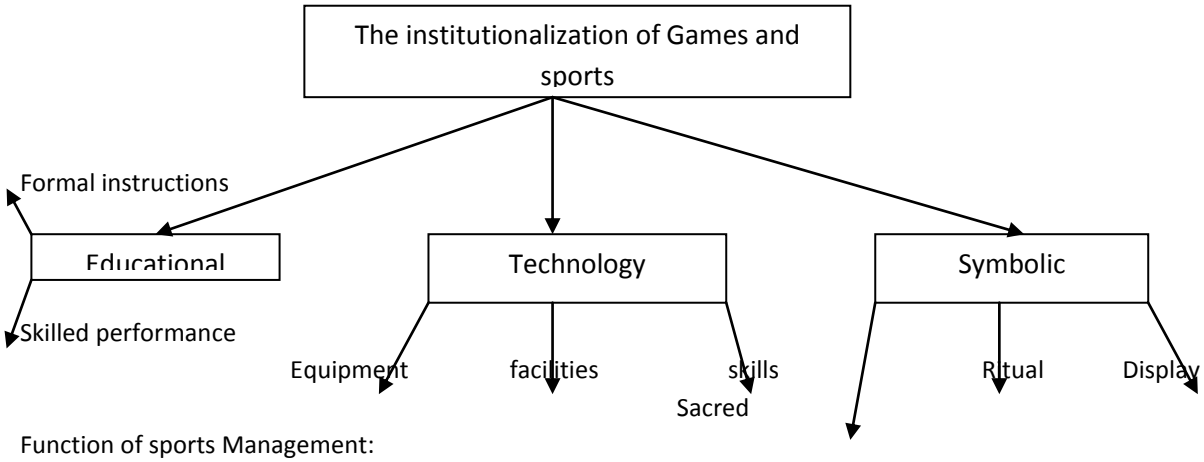


Function of sports Management:

There are four fundamental function of sports management.

1) Planning
2) Organizing
3) Actualizing
4) Controlling

Planning: Planning is essential in life. It is necessary for individuals, institutions and for organization. It establishes a frame work depending on -what to do? When to do? And how to do? (When sudden, accidental changes occur) It also gives direction to individuals and reduces un-productive work to a minimum.

Professional approach to sports management

Organizing:

a) Who is to do what?
b) With how much Authority?
c) Under what planning environment?

Actuating:

a) Involving the personals to do their Pre-prescribed work.
b) Willingly
c) Interestingly
d) Full Co-operation.

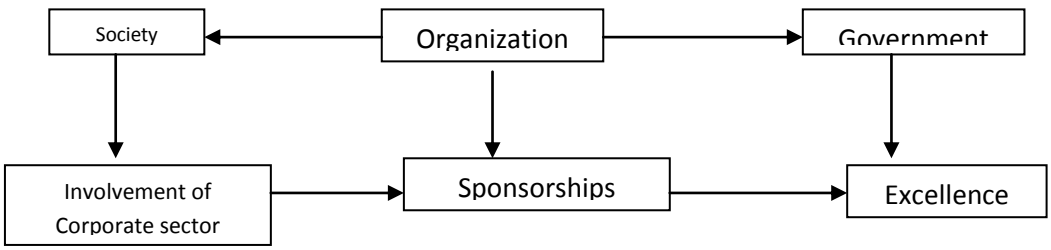
Controlling:

a) Follow-up to see whether the work is being properly carried out.
b) If not apply the proper remedial measures
c) Alternate personals.

The successful management depends upon the modern trends and facilities:

There are new trend and facilities, supplies and materials for physical Education and sports programmes including new surfaces, floor systems, new ceilings, partial shelters, synthetic and fiber materials etc.,

The excellence of sports management depends on facilities and modern technologies.



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- Further to use sports and physical activity to offer positive alternatives to anti-social behaviors such as drug use and crime and the problems that form a lack of self-esteem boredom, idleness, alienation and Poverty.
- Increased and enhanced participation give raise to ethical democratic practices and removal of caste prejudices, better family interactions and peer influence.
- Behavioral standards and goals that contribute to positive social relations and the motivation to succeed better use of free time.

Planning the facility:

Physical structure requires careful planning and consultation with specialists in architectural planning. Managers, physical educator, coaches, programme specialists, consultants and other personnel should participate in planning the new facilities. The principal related to facility management are:

1) Facilities for need.
2) Co-operative planning.

Steps of achieving best results:

1) planned proposal
2) secure consultants
3) faculty information
4) through check list
5) Work with specification.

Indoor check list

1) Multipurpose hall
2) Yoga hall.(exclusively prepared for yogic practice)
3) Secured belonging facility
4) Water facility
5) Sanitation facilities.
6) Gymnasium/ Fitness centre

Outdoor facilities

1) Play areas for major and minor games.
2) Facilities for disabled
3) Camping facility.
4) Minor recreational facilities.

Adventures activities to be introduced as a recreational activity:

1) hiking
2) Cycling
3) Rappling
4) Boating
5) Fishing

Maintenance: Planning for the construction of infrastructure is an important management function. Equally important responsibility of management restores maintenance. Proper maintenance of a facility will last longer, provide a healthy environment for the users, poor design in construction leads to poor maintenance. Proper plan and usage of first class materials will make the maintenance easier.

Funding: A crucial function of Management involves securing the funds necessary to provide sound physical Education programme. Adequate funding must be procured. Programmes and budgets implemented. Accountability for funds should be established. The source for income includes the college fund, sports fund, activity fees. Other sources of additional revenue are to be mobilized through government, Philanthropist, grants and special aids, sponsorships and a few specific fund raising events.

Utility: The Authorities should always keep open the facilities not only to the students but also to various community and other user groups.

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It is important that, for effective management guidelines are to established to ensure the proper use of such facilities. A return policy should be established and approved by proper authority regarding the community use.(Who can use? And at What Time?) Procedures regarding use should be utilized including such of the things as proper allocation, insurance coverage, fees structure, type of payment, stipulations regarding maintenance and security. Management should establish control mechanism to see whether the policies and procedures are carried out.

Personnel : As technology and information continues to expand, managing and promoting become more sophisticated. Even more well trained and prepared individuals have to be consulted and called on to perform the managerial duty required for the effective and efficient management and successful physical education and sporting operations.

Experience: Previous and continued involvement in Physical education and sporting activity.

Technical preparation: Certificates in First-aid, officiating, computer application, clinics, workshops.

Personality traits: Honesty, trustworthy, fairness, co-operation, dedication, amicability, professional ethics and decisive.

Technical Skills : Knowledge in equipments, procedures, techniques to perform the given tasks

Human skill: Ability to work with people, communication skill, attitude towards others, co-operative effort, motivation, understanding and sound judgment, predicting, diagnosing, attributing common sense,

Conceptual skills: The ability see the whole picture of the organization to formulate and implement strategic plan.

A better management perspective: The result of cost of building, salaries, supplies and every ingredients, renovation and maintenance has caused the reduction of offering services by everyone. For better management in physical education and sports.

1)Centralization of facilities

2) community movement, shared facilities.

The Problems and solutions with regard to competitions at various stages

There is a lot of problems which the organizers are facing at the time of sport s competitions are listed below:

1) Play ground
2) Equipment
3) Officials
4) Accommodation
5) Transport
6) Eligibility
7) Finance and Accounts
8) Specific rules to be followed- federations/ associations
9) Incentives
10) Provisions for spectators
11) Fixtures (timings should not be changed, walkover teams should intimate the organizers, the organizers should consent the opponent teams with regard to the change of time and venue due to the unavoidable circumstances.
12) Allotment of games to the various colleges, at district or at zonal/ inter-zonal competitions.

Problems: Allotment are not done on the basis of facilities but also on request

Solutions: Zonal and inter-zonal meetings with representatives with various zones.

13) reallocation of tournaments if necessary
14) Conduct of tournaments well in advance without affecting academic pursuits.
15) Coaching camps, formation of the teams,
16) Refresher courses, orientation programmes.

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Conclusion: Every professional should have a philosophical attitude towards his/her profession. The job or the assignment should not be accepted for just completing it. There should be effective and personal involvement with total commitment, dedication and sincerity will bear the fruit.

For ex: conduct of intramural or intercollegiate game should be organized to involve mass participation with a wider variety of sports, in order to involve all students of their choice.

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Invited Talk

BIO–MECHANICS AND SPORTS EXCELLENCE

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Spots Bio – Mechanics deals with the application of Physical principles which influences the human performance are equilibrium, Motion, Force, Kinetic and potential energy, Gravity, Airrestiance, Water Resistance etcetera.

"Bio – Mechanics is a science that examines the internal and external forces acting in the Human body and effects of all these forces."

Importance of Bio – Mechanics

1) It helps to understand the Influence of mechanical principles on the Human performance.
2) It helps to improve motor Qualities among athletes.
3) It helps the Athletes in self evaluation and perfection of various skills.
4) It helps in the invention of new techniques.
5) It helps in the selection of players and selection of Equipment.
6) It helps in the Diagnostic teaching and coaching.

Physics explains that" why" and" how "better performance is possible and gets an answer that efficient mechanism of the body. The Structure of human body to which human machine can be put depends upon the way it is built, Its structure, Composition and working capacity

Physical Prerequisites - The Degree to which movement can be effective can be influenced by body built, reaction time, strength, power, flexibility and the aquity of the senses. The importance of each of the above depends upon the movement task to be performed.

Mental Prerequisites – Whenever a moving object is involved, one must judge the speed of its movement, distance, and height and as well as the force which results from contact must be assessed.

Emotional Prerequisites – Despite the Physical and mental Prerequisites of an athlete – teaching will not be effective unless there is a feeling of the need and desire to learn particular skill involved. It is necessary to understand the various physical principles and their role in sports performance.

Equilibrium is the most significant of all the physical principles in mechanics that are involved in sports techniques. Thus equilibrium plays an important role in describing the degree of stability relative to the fundamental movements executed in relation with the specialization. In every activity or skill the body is said to be in equilibrium in relation to the position of center of gravity within the body in executing simple to complex movement.

Motion consists of the movement of the body as a whole, the movement of some members of a body or the movement of some object or the implement by the body. This motion is a function of direction and speed. All other physical principals are essentially understood their importance and application for enhancing athletic ability.

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THE EFFECT OF KINESIO TAPING ON LOWER TRUNK ROM

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ABSTRACT
The purpose of the study was to determine the effects of kinesio taping (KT) on trunk flexion, extension, and lateral flexion. Thirty healthy subjects with no history of lower trunk or back issues participated in the study. Subjects performed two experimental measurements of range of motion (with and without the application of KT) in trunk flexion, extension, and right lateral flexion. A dependent t test was used to compare the range of motion measurements before and after the application of KT. Through evaluation of the sum of all scores, KT in flexion produced a gain of 17.8 cm compared with the non-kinesiotape group ($t(29) = 2.51, p < 0.05$). No significant difference was identified for extension (-2.9 cm;$t(29)=-0.55$, $p > 0.05$) or lateral flexion (3 cm; $t(29) = -1.25$, $p > 0.05$). Based on the findings, we determined that KT applied over the lower trunk may increase active lower trunk flexion range of motion. Further investigation on the effects of KT is warranted.

Keywords: sensory receptors, blood and lymphatic flow, trunk flexion, flexibility, taping techniques.

INTRODUCTION

Lower trunk/back pain is a significant health problem contributing to a significant economic cost in the United States (Pai and Sundaram 2004). Approximately 85% of the U.S. population suffers at least one back injury or issue over a lifespan (Lively 2002). Many treatment methods exist including physical therapy, adjustable beds, ointments, and herbal remedies. Current treatments, however, have been shown to produce varying outcomes (Pai and Sundaram 2004). Kinesio tape, an alternative taping technique, has been theorized to improve a variety of physiological problems, including the range of motion, based on the functions of the tape (Kase 2001; Kase et al. 1996; Garcia 2001; Goo2001; Halseth et al., 2004; Maruko 1999; Murray and Husk 2001;Ogura 1998; Oliveria 1999; Vochies 1999; Wallis 1999; Kase 1994;Kase et al. 2003). Currently research is lacking regarding the use of Kinesio tape as a viable option for increasing flexibility, specifically with back injury patients. Injury prevention, treatment, and rehabilitation techniques in the United States have historically followed a Western medicine approach;

the use of alternative treatments, such as KT recently has emerged as a viable option to treat athletic injuries. Kinesio tape is theorized to have several functions: (1) restoring correct muscle function by supporting weakened muscles, (2) reducing congestion by improving the flow of

blood and lymphatic fluid, (3) decreasing pain by stimulating neurological system, and (4) correcting misaligned joints by retrieving muscle spasm (Kase 2001; Kase et al. 1996; Garcia 2001; Goo 2001; Halseth et al. 2004; Maruko 1999; Murray and Husk 2001; Ogura 1998; Oliveria 1999; Vochies 1999; Wallis 1999; Kase 1994; Kase et al. 2003). Kinesio tape is unique compared with other types of tape because the elasticity allows for elongation 130%–140% of its resting state and is approximately the same weight and thickness of skin (Kase 1994; Kase et al. 2003). Thus, KT has been theorized to be an effective treatment to restore muscle function and decrease pain (Kase et al.1996; Goo 2001; Maruko 1999; Murray and Hosk 2001; Ogura 1998;

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Oliveria 1999; Vorhies 1999; Wallis 1999); however, a dearth of information exists regarding empirical evidence of efficacy in general, and specifically on the lower trunk. Therefore, the purpose of study is to determine the effects of KT on lower trunk flexion and extension and
lateral flexion.

METHOD

The current study assessed the effect of kinesio tape on lower trunk flexion, extension, and right lateral flexion range of motion. Trunk range of motion was recorded before and after the application of kinesio tape. Thirty healthy subjects (15 females, average age (26.9+−5.9; and 15 males, average age(20.9+−12.1) voluntarily participated in the study. Subjects were eliminated if they had lower trunk injury or pain 6 months prior to the time of testing. The research protocol was approved by the Human Subjects-Institutional Review Board, and all participants signed an informed consent form prior to the experiment.

Procedures

Initially each participant was measured for trunk range of motion (ROM) using a tape measure. The same tape measurement procedure has been reported previously and has high levels of reliability with repeated measures (flexion: r = 98, extension: r = .96, lateral flexion: r = .98,*r = reliability; Frost et al. 1982). Subjects performed a static stretch for 15 seconds in the three trunk motions that were tested for injury prevention purposes. For flexion, subjects stood on the stepstool with arms in a neutral position, heels together, and knees straight. Subjects bent forward as far as they could with fingers straight. The distance between the tip of third finger and the floor was measured. For extension, subjects stood on the floor with arms in the neutral position, heels together, knees and back straight. Two landmarks were used to measure the range of motion of extension, the spinous process of C7 and the imaginary line between right and left posterior superior iliac spine. Subjects extend the lower trunk as far as they could, and the distance between two landmarks was measured. For right lateral flexion, subjects stood on the floor with arms in the neutral position, heels together, knees and back straight. Subjects bent toward the right with elbow and fingers straight and attached hand on their lateral side of leg. The distance between the tip of third finger and the floor was measured . Range of motion was measured three times for reliability, before and after the application of Kinesio tape. A crossover design was used to eliminate the ROM taping routine as a variable. Kinesio tape was applied to 15 of the subjects after the end of three ROM measurements in the untapped status. The remaining 15 subjects performed three ROM measurements in the taped status first, followed by the untapped status. Subjects randomly were assigned in regard to the order of the two statuses.

Taping Method

Subjects were taped using a mthod proposed for the sarcospinaris muscle. Y-shaped (2-inch width and 11-inch length) tape was used in the study (Figure 4; Kase 1994; Kase et al. 2003). The taping technique required subjects to stand erect while the origin of the Y-shaped taping technique was attached over the center of the sacrum. The origin of the Y tape was attached without stretching the kinsio tape while subjects gradually bent forward. The same procedure was applied to the other end of the Y tape. A 5-degree angle was maintained within the valley of the Y tape. The Y-shaped tape was applied from the origin of the sacrospinalis to the insertion as theorized to support a muscle function. A dependent t test was used to determine differences before and after the application of KT (Thomas and Nelson 2001). A dependent t test was used to assess two groups with the same subjects who were administered a pretest and a post-test. The average of the three trials for each ROM was computed for statistical analysis. T values for trunk ROM were computed to compare a t value of 1.699, which is the critical value for an alpha level of .05.

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RESULTS

A significant difference was identified for trunk flexion ROM (Table 1). The taped condition in flexion was 17 cm higher than the untaped condition in the sum of all scores ($t(29)=2.51$, $P < .05$). No significant differences were found for extension (−2.9 cm; $t(29)=-0.55$, $p > .05$) and lateral flexion (3 cm; $t(29)=-1.25$, $p > .05$).

DISCUSSION

Results of the study suggest that KT may increase active ROM of lower trunk flexion even though no effect was identified for extension and lateral flexion ROM. Two theories may aid in understanding this finding. One theory is that KT increases blood circulation in the taped area (Ogura 1998; Oliveria 1999; Vorhies 1999; Wallis 1999; Kase 1994; Kase and Hashimoto 2005; Murray 2005), and this physiological change may affect the muscle and myofascia functions after the application of kinesio tape. An additional theory is that KT stimulates cutaneous mechanoreceptors at the taped area, and this stimulation may affect the ROM (Garcia 2001; Goo 2001; Halseth et al. 2004; Muruko 1999; Mori 2001; Murray and Husk 2001; Ogura 1998; Vorhies 1999; Wallis 1999). Neither of these theories accounts for why kinesio tape has an effect on trunk flexion ROM and not on either extension or lateral flexion ROM. The specific Y taping technique with attachment at the sacrum followed by stretching of the tape in extension used in this study may be beneficial only in increasing the flexibility of trunk flexion. Additional taping techniques such as a Y or straight technique placed while the participant is in extension or lateral flexion should be investigated to ascertain whether these techniques are more appropriate for those motions.

CONCLUSION

The effect of KT using a Y flexion pattern may improve the active range of motion in lower trunk flexion. Medical professionals may apply KT to a patient during or after treatment and rehabilitation to support low back musculature, to encourage the tissue healing process, and to avoid limiting the enhancement of improved trunk flexion ROM. Further research is required to validate the effects and efficacy of KT. Kinesio taping has shown promise in several select uses and thus should be investigated further with regard to proper technique and efficacy for specific pathological conditions.

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WELLNESS THROUGH YOGA

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ABSTRACT
Wellness is the topic which is widely discussed now a days by everyone. It is the major topic of discussion in the Media and also the conference and seminars. Wellness is defined as "A conscious, self directed and evolving process of achieving full potential". Mainly there are eight dimensions of wellness and majority of those dimensions can be developed and maintained through Yoga. Yoga is the greatest contribution of our country to the world. It is the indigenous activity which was born in our country many centuries ago. It is an ancient system developed over the centuries by the sages of India. Yoga is a system of training our Body, Mind and the Spirit. This paper is an attempt to discuss the role of yoga in achieving wellness.
Keywords : Yoga, Wellness, Indigenous Activity

INTRODUCTION
Yoga is the greatest contribution of India to the World. Yoga is the most enjoyable activity everyone can participate. Yoga the art and science of maintaining physical and mental wellbeing that has its origin in India, is among the most ancient yet vibrant living traditions that is getting increasingly popular today. A potent stress buster, yoga is an instrument of self-evolvement and enlightenment through physical and mental well-being.
Yoga helps improving and maintaining wellness. Wellness is an active process of becoming aware of and making choices toward a healthy and fulfilling life. "..a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." - The World Health Organization.
Wellness is the realization of our true potential to live a healthier, happier and more successful existence.
Wellness is the result of personal initiative, seeking a more optimal, holistic and balanced state of health and well-being across multiple dimensions." by John Valenty, CEO Wellness.com
"Wellness is the dynamic process of becoming aware of, taking responsibility for, and making choices that directly contribute to one's well being and that of the common good." by University of Miami
Maintaining an optimal level of wellness is absolutely crucial to live a higher quality life. Wellness matters. Wellness matters because everything we do and every emotion we feel relates to our well-being. In turn, our well-being directly affects our actions and emotions. It's an ongoing circle. Therefore, it is important for everyone to achieve optimal wellness in order to subdue stress, reduce the risk of illness and ensure positive interactions.

Dimensions of Wellness :
1. Physical Wellness
2. Mental Wellness
3. Emotional Wellness
4. Social Wellness
5. Spiritual Wellness

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6. Environmental Wellness
7. Occupational Wellness and
8. Financial Wellness

How yoga helps improving Wellness?

Participating in physical education and sports helps a child in the development of allround personality by improving the physical fitness, and physical fitness is the pre-requisite of all other fitness such as mental, emotional etc.

Fitness can be achieved through participating in most enjoyable activity according to one's needs and ability. Yoga is one such activity everyone can participate.

Yoga helps in developing all the health related fitness components. Suryanamaskar and yogic asanas help in improving muscular strength and muscular endurance.

Pranayama increases vital capacity, helps in absorption of oxygen with increased efficiency of exchange of gasses and improve the cardiovascular efficiency as a whole.

Yoga is a passive and static activity. Suryanamaskar and most yogic postures involve bending forward, backward and sideways and holding the position for a while. Yoga postures help in stretching and relaxing the muscles and skeletal system, thus helps in improving flexibility.

Yoga helps in reducing the fat, reduced fat and toned up muscles help in developing proper body composition. There are many research evidences to prove the effect of yoga in improving the health related fitness.

- Yoga ensures harmonious growth and development.
- Improves concentration.
- Helps in stress management
- Yoga 'Imbibes Values'.
- Yoga can be a 'panancia' for many social evils.

CONCLUSION

"Wellness is the key for happy living and success." Yoga goes a long way in improving and maintaining wellness. So, yoga should be made a way of life.

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EFFECT OF SELECTED ASANAS AND PRANAYAMA ON KNEE FLEXIBILITY OF DISABLED STUDENTS AS A FUNCTION OF AGE AND SEX

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ABSTRACT

In the creation of God, every human being is created with equal potentialities. He created man with his own image. So among all living creatures, human being are considered as "The superior" than any other living beings. The human beings posses certain characteristics that separate them under viably from all other living creatures. Through we are far superior to the creative's, we have some defects or deformities. The system of yoga of health is a culture that has been practiced by the yogis in India for a thousand of years. Man's fist duty is to acquire robust health and the goal of life is to achieve while still alive a state of health. Asana is the third limb of the Hatha Yoga otherwise known as Astanga yoga. Yoga a gentle breathing exercise. Yoga is never strenuous, its movements are gentle, especially designed to rid your body of muscular and mental tension. Pranayama is a yogic exercise in respiration. Pranayama the method of breathing system in yoga. Disability refers to a functional definition that described limitations in performing certain skills on engaging certain activities stemming from impairment. A man's movement in all aspects of life either in walking, running, jumping or performing same skills, needs graceful movement that mostly depend on the flexibility of the joints and muscles.
Key words:The superior, deformities, Astanga Yoga, disability, impairment

INTRODUCTION

The system of yoga of health is a culture that has been practiced by the yogis in India for a thousand of years. Man's fist duty is to acquire robust health and the goal of life is to achieve while still alive a state of health. Healthy people are an asset to a Nation while the sick people are liabilities. It gives a sense of relief, refreshment and enjoyment. Good health implies a normal functioning of all parts of the body resulting in physical and mental stability. It reflex a state of mental, social and physical fitness and well being and influenced by life style.

The human beings posses certain characterstics that separate them undeniably from all other living creatures. Through we are far superior to the other creatives, we have some defects or deformities.

The cause of defects or deformities may be due to lots of different factors. The deformities would be overcome by some special peculiar adaptation, which is given to human in nature. Hence normally the word health is always used to denote a condition of physical soundness.

Asana and pranayama are the limbs of the Hatha yoga otherwise, known as Astanga yoga. Yogic exercises not only develop the body but also broaden the mental faculties. The main of yoga postures is not merely the superficial development of muscles. The postures to tend to normalize the functions of the entire organism, effective working of all glands as well as the nervous system and the mind. Even pranayama also the system of respiration in maintaining and developing healthy body for the effective livelihood. Though the parts of the body and the man as a whole can function effectively without food and water for days together, it is not

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possible for the body to function even for few minutes without respiration. The respiration system is being direct stimulant, must be cared for the effective living.

Disability refers to a functional definition that describes limitations in performing certain skills or engaging certain activities stemming from impairment. A large number of children are disabled physically or psychologically. It is a social responsibility to help the disabled and to aid them to lead an independent and economically sound life. A notable percentage of the human beings throughout the world are physically disabled with different degree namely neuromuscular disorder, auditory, visual disorders orthopedically incapacitated epileptic, cardiac and mentally retarded.

For the all deformities the main cause is cerebral palsy. It is a general expression of given to a number of non progressive neuro-motor disorders occurring before, during or after birth. Most cerebral palsied have numerous limitations, but medically they are not sick. They frequently have functional disturbances and structural weaknesses. A high 15 percent of the school aged cerebral palsied are estimated to have hearing impairments that interfere with their education.

The great tragedy in the lives of most cerebral palsied children is not only physical handicap, but the things that it brings with it the isolation from normal childhood experience. A man's movement in all aspects of life depend on the flexibility of the joints and muscles of the body generally the physically handicap people are having flexibility in their joints of the body particularly in lower limbs.

Objective of the study: The main objective of the study was investigate the effect of selected asanas and pranayama on knee flexibility of disabled students as a functional age and sex.

Hypothesis: It was hypothesized that the selected asanas and pranayama

1) Would have greater influence on knee flexibility.

2) Would help to know the interest and the attitude of disabled students towards asanas and pranayama.

Methodology: The purpose of the study was to find out the range of flexibility when subjected to selected asanas and pranayama. To achieve this purpose, thirty disable students selected were randomly selected as a function of age and sex. In this study single group design was used.

The disabled students were subjected to training schedule which was specially selected to improve the knee flexibility. The training was given six weeks continuously with one hour of duration in the morning session. The goniometer was the apparatus used for this study to measure the angles at the knee joint. It was made up of plastic which consisted of hundred and 80^{o} protractor, on which degree etcetera. It has two arms each fifteen inches long. One of these arms in stationary, extended along zero line and the other arm is permitted to rotate to hundred and eighty degree. The mobile arm has a pointer to indicate the degree of flexibility.

Selection of the Test:

Variable	Test
Knee Flexibility	Asanas
	a) Arthapadmasana
	b) Swastikasana
	c) Sukasana
	d) Samasana
	e) Savasana
	f) Pranayama

Statistical Procedure: The data was collected from the subjected prior to the training and after the training schedule. Single group design was used and hence ratios were used. For the purpose of testing the difference between initial and final scores, 't'-ratio was calculated.

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Knee flexibility of disabled students on computation of the mean Standard Deviation, Standard Error of the mean, difference between the mean and 't' ratio separately presented below ---

The Mean, Standard Deviation, Standard Error of the Mean, Difference between Mean, Standard Error of the difference between Mean and 't'-ratio of the Initial Score and Final score on Knee Flexibility.

Table-I

Group	Mean	Standard Deviation	Standard Error of the Mean	Difference between Mean	Standard Error of the difference between Mean	't'-ratio
Initial Score	37.967	1.497	0.273			
				4.533	0.443	10.233*
Final Score	42.519	0.348				

* Significant

't' – Ratio required for significance at 0.05 level was 2.00 for a degree of freedom 58.

DISCUSSION

The data collected from the disabled students on the Knee flexibility analysed and interpreted. The 't'-ratio was calculated to find out the significance of the study. Table-I shows the difference between means of initial and final score on knee flexibility of disabled students were 4.533 and the Standard Error of the difference between means was 0.443. The calculated 't'-ratio was 10.233. The 't'-ratio was found to be significant at 0.05 level of confidence and hence the hypothesis was accepted. The result of this study indicate that the selected asanas and pranayama have greater influence on knee flexibility on disabled students. It shows the test was significant.

Conclusion

On the basis of the results obtained by statistically analyzing the data on knee flexibility of disabled students, the following conclusions were drawn –

1. The regular practice of selected asanas and pranayama has increased the knee flexibility to some extent.
2. Asanas may be restored for the improvement of Flexibility at various joints.

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ANALYSIS OF MORPHOPHYSIOLOGICAL AND BIOMOTOR VARIABLES AMONG DIFFERENT LEVELS OF HOCKEY PLAYERS

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INTRODUCTION

Hockey as a game was introduced in India during the British rule. Indians quickly learned the game hockey and established it as one of the popular game. The efficiency of Indian hockey team was first tested in 1928 Amsterdam Olympics, where it won first Olympic gold medal. This winning streak in hockey was continued until 1980 Moscow Olympics and created a record of 8 gold, 1 silver and 2 bronze medals. However, with the introduction of artificial turf in early 1970s that changed most aspects of the game, and shattered India's glorious display of performance in world arena. Though, Indian hockey players are technically sound with stick and ball control, most of them were adapted only to play the game in gravel surface. The alteration in playing arena and rule drastically affected India performance. However, recently India performs brilliantly in Asian games, Champions trophy, World cup and other prestigious tournaments. India still strives to make impact on Olympics; in order to achieve government has launched several programmes. The nurturing of young players was carried out by Rural Development Trust (RDT), an NGO based in Anantapur, RDT Hockey academy benefited many young players across Andhra Pradesh, India.

Statement of the Problem:

The aim of this investigation is to compare RDT hockey academy male players of high and low achievers in terms of morphophysiological and biomotor variables.

Objectives of the Study

1. To evaluate the existence of significant difference in each of the morph physiological and biomotor variables of different levels of achievers in field hockey.
2. To realize the criterion variables that contributes to the classification of hockey players as high achievers and low achievers.
3. To derive a multiple regression equation that predicts hockey players of different levels of achievement from selected criterion variables.

Hypotheses:

1. There may be significant difference on selected criterion variables between high achievers and low achievers.
2. Additionally, it was hypothesized that the selected criterion variables may contribute to the classification of hockey players as high achievers and low achievers.

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3. Furthermore, it was hypothesized that the multiple regression equation may significantly predict hockey players of different levels of achievement from selected criterion variables.

Delimitations:

1. This study was confined to twenty nine (29) male hockey players from RDT Hockey Academy, Anantapur, Andhra Pradesh, India.
2. These players were selected during the academic year 2013 – 2014. The mean age of the subjects is 13.91 ± 1.78 years.
3. These subjects were classified into two groups, namely high and low achievers. High achievers group was accounted to 17 players and low achievers group with 12 players.

Limitations:

1. The heterogeneous character of the subjects in hereditary and environmental factors was considered as limitation.
2. The disparity prevailed in internal and external factors during testing periods could not be controlled.
3. The number of subjects considered in this study was limited to 29 only, which might not be sufficient enough to draw a positive report from statistical analysis.

Significance of the Study:

1. The study will help the researchers, coaches and physical educators to identify performance characteristics that could help to predict future elite youth field hockey players.
2. The study will help to understand the level of morphophysiological and biomotor variables between high and low achievers youth field hockey players.
3. The study will assist the trainers to develop suitable conditioning programme to develop aerobic capacity and biomotor variables based on their requirement to perform skills efficiently.
4. The study will also provide guidelines to categorize the hockey players on the basis of their motor fitness level. However, an alternative explanation is that the high achievers youth players have inherited a more favourable genetic profile for success in field hockey. The study will also make addition to the already existing knowledge of physical education and sports sciences.
5. This study was the first to systematically analyse the somatotype, size and body composition of high and low achievers male field hockey players from RDT Hockey Academy, Anantapur, Andhra Pradesh, India.

Selection of Subjects:

The study was proposed to compare RDT hockey academy male players of high and low achievers in terms of morphophysiological and biomotor variables. To accomplish the purpose of the study, twenty nine (29) male youth field hockey players were selected at random as subjects, who volunteered to participate in this study. These players were randomly classified into two groups namely high and low achievers. The high achievers group constitutes of 17 players and low achievers group constitutes of 12 players. These players were selected from RDT Hockey Academy, Anantapur, Andhra Pradesh, India. These players were selected during the academic year 2013 – 2014.

Classification of Subjects:

The subjects were classified into high and low achievers for this study. High achievers subjects who represented highest level of competition and low achievers are immediately below high achievers level. This classification is done in accordance with the study carried out by Elferink-Gemser, *et al*., (2004).

Selection of Tests and Variables:

The investigator inferred to various relevant literature, consulted with experienced experts in sports and biochemistry to identify ideal variables. In addition to this by using the investigator's personal knowledge and professional experience the following most ideal variables were selected in the present investigation.

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Table

S.No	Variables	Methods / tests /equipment
I	**Morphophysiological variables**	
1.	Anthropometry	
	Height (m)	Stadiometer
	Weight (kg)	Weighing machine
2.	Body Composition	
	a. Percent body fat (%)	Skinfold Caliper
	b. Lean body mass	Skinfold Caliper
3.	Somatotype	
	a. Endomorphy	Heath carter method
	b. Mesomorphy	Heath carter method
	c. Ectomorphy	Heath carter method
II	**Biomotor variables**	
4.	Speed (sec)	30 m dash
5.	Power (cm)	Standing broad jump
6.	Agility (sec)	6x10 agility test
7.	Flexibility (cm)	Sit and Reach Test
8.	Strength	
	a. Back Strength (kg)	Back and leg dynamometer
	b. Shoulder Strength (number)	Pushups
	c. Abdominal Strength (number)	Sit ups
	d. Grip Strength (kg)	Grip dynamometer
9.	Endurance	
	a. VO_2 max predicted (ml/kg/min)	1mile run and walk test

Statistical Analysis

SPSS statistic software package (*SPSS Company, America, version 11.0*) was used in statistical analysis for the morphophysiological and biomotor performance measurements. Descriptive report was given to all measured and derived variables. ANOVA was used for comparisons of mean values between the high and low achievers field hockey players. This ANOVA was performed between unequal groups, since high achievers consist of 17 subjects and low achieves consist of 12 subjects. Intra class correlation was applied to know the correlation coefficient. The α value of 0.05 was set for statistical significance.

In table the subjects numbered 1, 12 & 15 actually belong to the group membership of high achievers, but the analysis predicts them to be in the group membership of low achievers based on their respective discriminant scores of – 1.705, – 1.372 and – 0.423.

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Results of the study:

Case wise statistics information about group membership for each subjects, probability of group membership and discriminant scores

Subject Number	Actual Group	Predicted Group	Squared Mahalanobis Distance to Centroid	Discriminate Scores
				Function 1
1	1	2**	6.639	-1.705
2	1	1	5.369	1.082
3	1	1	4.209	0.816
4	1	1	4.292	0.836
5	1	1	10.416	1.992
6	1	1	4.079	0.784
7	1	1	8.693	1.713
8	1	1	10.759	2.045
9	1	1	3.562	0.652
10	1	1	2.200	0.248
11	1	1	4.480	0.881
12	1	2**	5.034	-1.372
13	1	1	13.780	2.477
14	1	1	5.169	1.038
15	1	2**	1.677	-0.423
16	1	1	8.693	1.713
17	1	1	10.759	2.045
18	2	2	6.423	-1.662
19	2	2	3.719	-1.056
20	2	2	1.950	-0.524
21	2	2	3.685	-1.048
22	2	2	8.753	-2.086
23	2	2	1.677	-0.423
24	2	2	9.321	-2.181
25	2	2	10.811	-2.416
26	2	2	2.395	-0.675
27	2	2	3.646	-1.037
28	2	2	2.395	-0.675
29	2	2	3.646	-1.037

** Misclassified Subjects

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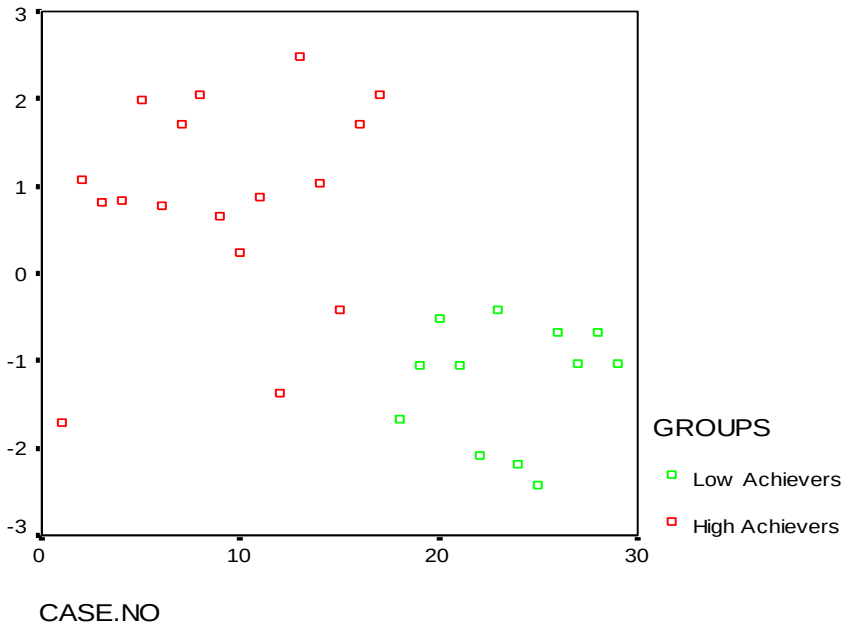
The discriminant score of the data collected for high achievers and low achievers is illustrated in the scatter plot as presented in figure

Graphical illustration of discriminant scores



Classification results

			Predicted Group Membership		
		GROUPS	High Achievers	Low Achievers	Total
Original	Count	High Achievers	14	3	17
		Low Achievers	0	12	12
	%	High Achievers	82.4	17.6	100.0
		Low Achievers	.0	100.0	100.0

Table summarizes the number and percentage of subjects classified correctly and incorrectly as high achievers and low achievers. It is found that fourteen (14) of seventeen (17) subjects classified as high achievers is correct, while three (3) of them were incorrect as the analysis predicts them to be as low achievers. Furthermore, it is found that all the twelve (12) subjects classified as low achievers were correct. Thereby 89.7% of original grouped cases (*subjects*) were correctly classified.

Conclusions:

1. The high and low achievers youth hockey players have no significant difference in height and weight.
2. The high and low achievers youth hockey players have no significant difference in percent body fat and lean body mass.
3. The high and low achievers youth hockey players have no significant difference in endomorph, mesomorph and ectomorph.

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4. The somatotype of high and low achievers is mesomorphic ectomorph because ectomorphy is dominant, with mesomorph second in dominance.
5. The high and low achievers youth hockey players has a significant difference in speed, back strength, grip strength (*right & left hand*), and aerobic capacity. High achievers performed better than low achievers.
6. The high and low achievers youth hockey players has no significant difference in power, agility, flexibility, shoulder strength and abdominal strength.
7. The subjects classified correctly as high achievers and low achievers are 89.7 percentages. The remaining 10.3% were misclassified and accounts for three (3) hockey players. These misclassified players actual membership is high achievers, but they were predicted to be low achievers based on their criterion variables.

Recommendations:

1. The coaches should test the morphophysiological and physical variables in identifying the highly potential junior hockey players, and further by comparing of morphophysiological and physical variables ~~with~~ among Indian elite junior and senior players can enlighten the focal attributes to be addressed in enhancing performance in field hockey.
2. The limitation of the study is number of subjects available in RDT hockey academy, bearing this in mind the investigator recommends to repeat the study with large sample.
3. Relation between multidimensional performance characteristics and level of performance in talented youth field hockey players has to be recognized by the coaches in categorizing young players.
4. The next and foremost step for the RDT hockey academy is to specify the underlying processes of the multidimensional performance characteristics to its coaches, to measure these performance characteristics in training and competition for the players, and to evaluate current training programs.
5. This investigation suggests a canonical discriminant equation that helps in categorizing youth field hockey players as different levels of achievers.
6. Multidimensional performance characteristics of both genders at elite and sub-elite levels need to be assessed before maturity.

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FITNESS, WELLNESS AND HEALTHY LIFESTYLE

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Engaging in sport and physical activities, including physical fitness activities, plays a significant role in promoting health and wellness among children and adolescents. Not only does such activity help improve the physical fitness and health of children and youth, but also it is an integral strategy for stemming childhood obesity—a critical health priority for our nation.

Exercise tests us in so many ways, our skills, our hearts, our ability to bounce back after setbacks. This is the inner beauty of sports and competition, and it can serve us all well as adult athletes. Physical exercise, in formal sense of the term, may refer to the physical activity that is planned, structured and repetitive bodily movement done to improve or maintain one or more of the components of physical fitness, aerobic capacity, muscular strength, muscular endurance, flexibility and body composition.

Well being: Well being is the very wide term but form the view point of health and happiness, it is the highest state of physical, mental, intellectual and emotional wellness in which an individual **lives most** and **serves best.**It is a rare kind of feeling, a pervasive sense that life, as a whole, has been and is good, fulfilling, meaninggul and pleasant. That way, it is one of those elusive things that a person is more aware of when it is missing. Physical well to a great extent, automically leads to mental, intellectual and emotional well being.

Feeling of physical well being:

- Free of general aches and pains of life that come from not being adequately fit and health.
- Our basic need for food, water and shelter are adequately met.
- Enough energy and stamina to accomplish our daily tasks and full fill our recreational desires, and still left with some energy to meet emergencies.
- Our brains can maintain sufficient alertness and focus to enable our mental processes to function at an optimal level of deficiency, and we are sensitive to the changes taking place in our environment and are able to respond to them.
- Able to achieve satisfying physical experiences, with in the limit of our own awareness and awakening.

The concept of wellness incorporates many components in addition to those associated with physical fitness. These include proper nutrition, smoking, stress, alcohol and drug.

Effect of exercise on well-being: There is little doubt that regular physical activity, as a measure of physical well being, can improve health and reduce the risk of premature death for it a) reduces the risk of developing coronary heart disease (CHD) and the risk of dying from CHD, b) reduce the risk of stroke, c) reduce the risk of having a second heart attack in people who had already had one heart attack, d) lowers both total blood cholesterol and triglycerides and increases high density lipoproteins, e) lower the risk of developing high blood pressure, f) helps reduce blood pressure in people who already have hipper tension, g) lowers the risk of developing non insulin dependent (type -2) diabetes mellitus, h) reduce the risk of developing colon cancer, i) helps people achieve and maintain a healthy body weight, j) reduce feeling of depression and anxiety, k)

promotes psychological well being and reduce the feelings of stress, l) helps build and maintain healthy bones, muscles, and joints, m) helps older adults become stronger and better able to move about without falling or becoming excessively fatigue.

Exercise is an important part of keeping children healthy. Encouraging healthy lifestyles in children and adolescents is important when they grow older. Lifestyles that are learned in childhood are more likely to stay with the child into adulthood. Changes in lifestyle are harder to make the older the person becomes. The best way to promote healthy lifestyles is for the whole family to become involved and steps to be followed.

Fitness: Starting a fitness program may be one of the best things you can do for your health. After all, physical activity can reduce your risk of chronic disease, improve your balance and coordination, help you lose weight, and even boost your self-esteem. And the benefits are yours for the taking, regardless of age, sex or physical ability. We recommend that healthy adults include aerobic exercise and strength training in their fitness plans, specifically:

- At least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week
- Strength training exercises at least twice a week

Regular exercise can help you control your weight, reduce your risk of heart disease, and strengthen your bones and muscles. But if you haven't exercised for some time and you have health concerns, you may want to talk to your doctor before starting a new fitness routine.

When you're designing your personal fitness program, consider your fitness goals. Think about your fitness likes and dislikes, and note your personal barriers to fitness. Then consider practical strategies for keeping your fitness program on track.

Starting a fitness program is an important decision, but it doesn't have to be an overwhelming one. By planning carefully and pacing yourself, you can make fitness a healthy habit that lasts a lifetime.

Stretching and flexibility; Stretching is a powerful part of any exercise program. Most aerobic and strength training programs inherently cause your muscles to contract and tighten.

Stretching after you exercise may help improve the range of motion about your joints and boost circulation.

As a general rule, stretch your major muscle groups after you exercise. In some studies, pre-athletic event stretching has been shown to decrease athletic performance.

Overall, however, stretching after exercise can help you to optimize your joint range of motion. If you don't exercise regularly, you may want to stretch a few times a week after a brief warm-up to maintain flexibility.

When you're stretching, keep it gentle. Breathe freely as you hold each stretch for around 30 seconds. Try not to hold your breath. Don't bounce or hold a painful stretch. Expect to feel tension while you're stretching. If you feel pain, you've gone too far.

Moving in sport- or activity-specific motion planes in gradually progressive speed (dynamic stretching) may be a helpful complement to static stretching and may help improve athletic performance.

Aerobic exercise: Regular aerobic exercise can help you live longer and healthier. After all, aerobic exercise reduces health risks, keeps excess pounds at bay, strengthens your heart and boosts your mood.

Healthy adults should aim for at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week. That doesn't have to be all at one time, though. Aerobic exercise can even be done in 10-minute increments.

And recent studies report significant health benefits from interval training, which means exercising at your near maximal intensity for short periods of 60 to 90 seconds.

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For many people, walking is a great choice for aerobic exercise. In fact, walking is one of the most natural forms of exercise. It's safe, it's simple and all it takes to get started is a good pair of walking shoes and a commitment to include aerobic exercise in your daily routine.

Of course, there's more to aerobic exercise than walking. Other popular choices include swimming, bicycling and jogging. Activities such as dancing and jumping rope count, too. Get creative.

Strength training: Strength training can help you tone your muscles and improve your appearance. With a regular strength training program, you can reduce your body fat, increase your lean muscle mass and burn calories more efficiently.

Better yet, strength training doesn't have to take as long as you might think. For most people, one set of strength exercises for major muscle groups performed two to three times a week is sufficient.

Strength training can be done at home or in the gym. Free weights and weight machines are popular strength training tools, but they're not the only options.

You can do strength training with inexpensive resistance tubing or even your own body weight. With proper technique, you may enjoy noticeable improvements in your strength and stamina over time.

Sports nutrition: How much do you know about sports nutrition? What and when you eat can affect your performance and how you feel while you're exercising. Brushing up on sports nutrition basics can help you make the most of your exercise routine.

Sports nutrition often focuses on carbohydrates. For example, athletes training for endurance events may eat more carbohydrates in their diet in the days before the event to boost their energy and performance. Protein for muscle repair and growth is another important aspect of sports nutrition.

Of course, sports nutrition goes beyond simply what you eat. When you eat is important, too. To maximize your workouts, coordinate your meals, snacks and drinks. Drink fluids such as water during and between meals.

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PSYCHOLOGY OF SPORTS COMPETITION

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Meaning of psychology

Field of psychology is considered to be originated from Aristotle's treatise named De anima. For the first time, word psychology was used by Rudolf Goeckel, who used it for study of mind of a living organisam.Thus, the concept of psychology got originate in the year of 1590.

If we look at literal meaning of psychology, then it will be found that this word came into being from combination of two words, namely, psyche and logos, which are Greek words. In simple language, psyche implies soul of a being while loges stands for act of talking or studying. Thus meaning of word originated from combination of these words will be study of sole of a being. After it's coming into being, this concept becomes widely used and since then, it has not lost its originality.

Another important theory of psychology provided by an expert named Watson. According to his theory, psychology was an objective science which helps to study the behavior of living organism, which is objective and subjective. His theory was based on the assumption that whatever an individual does, his or her inner being is get reflected in those activities.

Generally question is asked by some people that whether sports psychology can learn something about performance enhancement from coach of team. In reality, successful coaches and athletes are people who make it a point to study their sports and master the mental elements of the game. This process can be speeded up an refined though the correct application of the scientific principles of sports psychology. It is found that elite athletes generally recognize the need for a professional sport as athletes came into actual contact with sport psychologist. This perception was observed to increase as athletes came into actual contact with sport psychologists' services.

DEFINED SPORT PSYCHOLOGY:

Sport psychology is a science in which the principles of psychology are applied in a sport or exercise setting. These principles are often applied to enhance performance. However, the true sport psychologist is interested in much more than performance enhancement and sees sport as a vehicle for human enrichment. A wit-at-all-costs attitude is inconsistent with the goals and aspirations of the best sport phychologist.It are possible that a quality sport experience can enhance an athlete's intrinsic motivation without the athlete necessarily winning. Taken as a whole, sport psychology is an exciting subject dedicated to the enhancement of both athletic performance and the social-psychological aspects of human enrichment.

Development of sports psychology: Sports psychology as field of study is extremely young and still evolving. The first clear example of historical research being conducted in the area of sport psychology was reported by Norman Triplett. Drawing upon field observations and secondary data, Triplett analyzed the performance of lists

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under conditions of social facilitation. He concluded from this milestone research that presence of other competitors was capable of facilitating better cycling performance.

Another significant event in the 1960s was the publication of "Problem of Athletes and how to Handle them "by Bruce Ogilvie and Thomas Tutko. This book and the author's personality inventory for athletes the Athletic Motivation Inventory –caught on with coaches and athletes. However received by sport psychology is much better received today than it was only a few short years ago. Bruce Ogilvie is referred to as the father of applied sport psychology.

A number of professional sport psychology organizations have evolved since the 1960s.In 1965 the International society of sports psychology, which sponsors worldwide meetings and publishers the International journal of sport psychology and the sport psychology, was organized in Rome. The purpose of the ISSP is to promote and disseminated information about the practice of sport psychology throughout the world.

IMPORTANCE

In an effort to promote the virtues of sport psychology to coaches, athletes, and prospective students, many thoughtful professionals have suggested contributions than sport psychologists can make to sport and physical education. Different roles and functions of the sport psychologist are outlined here. Generally, these roles and functions describe this sport psychologist in the categories of educator and researcher.

The clinical/counseling sport psychologist: The clinical / counseling sport psychologist is a person trained in clinical or counseling psychology and is a licensed psychologist. Generally, the clinical sport psychologist also has a deep interest in and understanding of the
sport athletic experience.

The Educational psychologists: Most sport psychologists who received their academic training though departments of physical education consider themselves to be educational sport psychologists.

The research sport psychologists: For sport psychology to be a recognized and respected social science, the knowledge base must continue to grow. It is the scientist and scholar who serves this important role. Fore the practicing sport psychologist to enjoy professional credibility, there must exist a credible scientific body of knowledge.

COGNITIVE PROCESS IN SPORTS

1.Dealing with negative thoughts: In various situations, a person finds himself trapped in negative thoughts. The reasons of such thoughts can be various, but it is necessary to deal with such kind of thoughts as it affects a person's performance in all the fields to a lot of extent. To tackle down the negative thoughts, it is necessary to make use of some specific processes, which should be done step-by-step.

2.First step-Thought Awareness: Today's life has become full of stress and in this situation, various kinds of negative feelings arise in human beings. It is found that generally such kind of feelings arise in a person who does not have self-confidence and who thinks about his future negatively. It is found by various studies that such kind of negative thinking damages a person's performance to a lot of extent and even also hampers his mental skills.

3.Second Step- Rational Thinking: In this process, one is required to challenge all kinds of negative thoughts that arise in the mind. For this purpose, one is require to look at the negative thoughts which were being written down by the person in thought awareness process.

Generally it is found that various kinds of negative thoughts get arise in player's mind when they feel that they are not trained properly or have got inadequate training. There are other reasons which led to arousal of negative thoughts, one of which is feeling of anxiety about the factors which are out of control.

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CONCEPT OF COMPETITION

Word competition has been derived from a Latin word computer, which means seeking something together. Generally, contest held between various persons is being indicated by concept of competition. In competition, performance of all the persons talking part, is being evaluated, which can be done in terms of his previous performance or in terms of his present performance. Thus, it can be said in simple terms that competition is a group Activity in which two terms take part, with varying number of players, who try to perform well in comparison to their opponents and though this try to obtain victory.

On the basis of number of players taking part in competition, sports competitions are being classified into two categories, namely, individual and group activities. In individual activities, only one person from a side participate while other side is also allowed to brings only one player, while in group activities, two terms participate in competition, in which only a specific number of players can be permitted to participate. In such competitions, it is necessary that both the terms include same number of players in their terms.

Talking about concept of competition in sports field, it can be said that although some people participate in sports activities only attain fun and pleasure while some to get a better health, but unless there is absence of competition, they even cannot get fun and pleasure to satisfactory extent. If there is competition in activity, then efforts done by participants will be higher and they will try to defend their opponents. Not only this, competition helps in keeping interest of participants in activity. Through competition, human beings get an important opportunity to know their own status in relation to others By this, they can learn about their strengths and weaknesses and can try to eliminate them, thus can develop their performance level.

Psychologically, sports competitions have a deferent face. It is found that when player is provided with training to participate in competitions, his confidence level gets aroused and he becomes so aggressive that he tries to gain control over his opponents at all the cost. All human beings try to get perfection in their life and they can only attain level of superiority by overcoming their shortcomings. When unable players are motivated to get victory over able players, then they get filled with feeling of getting perfection to such an extent that they even provide harm to their opponents. In such kind players, psychological level gets up heaved and they find it difficult to keep a control over their emotions and feelings during competition.

However, sports competitions have a positive effect also. Through this, Player learns their weaknesses and try to make alterations in them. With this, they become able to attain excellence not only in their field, but also in their life. Too much emphasis on success can lead to unequilibrium in state of physical and mental state of players. Players who participate in competition with such thinking often find themselves under a lot of stress, by which their performance level also gets affected negatively to a lot of extent.

- Need for motivating participants of sports competitions

An important factor which prepares the players to make best use of their best effort is motivation. Concept of motivation has been discussed in length in other chapter of the book, because of which here it is being described in brief. A teacher or coach makes use of two devices to motivate learners, which are extrinsic. In extrinsic means, all those physical rewards which are provided to players on winning are including, while through intrinsic means, it is tried by the teacher to develop level of self-confidence in them. Only that player or players can perform well in competition who have a positive attitude and an urge to win. This work can be done though the means of motivation. To the extent of winning, it is possible to motivate players either mentally or physiologically. The extent to which players should be motivated depend to a lot of extent on task, more will be the need to motivate players.

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THE EFFECT OF MODERATE INTENSITY AEROBIC, RESISTANCE AND INTERVAL TRAINING PROGRAM ON LDL-C IN YOUNG MEN

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ABSTRACT

This study examined the impact of 16 week program of maximal intensity aerobic, resistance and interval training program on LDL-C in 60 untrained men ages 21-25 years. To investigate the training effect of sixteen weeks of maximum intensity progressive aerobic, resistance and interval training program on LDL-C in young men. Participants were randomly assigned to an aerobic based training group (ABTG) n=15, resistance based training group (RBTG) n=15, Interval based training group (IBTG) n=15 and control group (CG) n=15 participants in the experimental groups performed their training protocols. Maximum intensity aerobic, resistance and interval training program on LDL-C show significant decrease when compared to control group and in between exercise protocol groups LDL-C is identical.

KEY WORDS: LDL-C, Aerobic, Resistance, Interval.

INTRODUCTION

Countries that have in terms of Technology development, as residents living, inactivity and passive enough to become prevalent that the prevalence of direct or indirect cause of many problems and issues such as health and wellness Heart diseases – Cardio Vascular Disease, Obesity and CAD is so that as a major problem in these communities are known. One of the Problems today especially in developed countries are Atherosclerosis is one. The health related physical fitness which is considered as key component in an individual's life is develop and protected through participation in various physical activities. Low density lipoprotein Cholesterol (LDL-C) is considered the most potent independent risk factor for coronary heart disease (CHD) and is inversely correlated with CHD1. Endurance exercise training characterized by continuous activity at moderate exercise intensity demonstrates significant decreases in LDL-C in both men and women after a period of training, typically 20-30% for endurance athletes compared with inactive controls (2, 3). Aerobic based training has been proposed as an effective mechanism for improving cardio vascular protection, with training resulting in decreases of LDL-C in men 18 years of age and older (4) also found positive training related adaptation on Total Cholesterol, Triglycerides, Low density lipoproteins Cholesterol and High density lipoprotein Cholesterol (5) or only on Low density lipoprotein Cholesterol and T.C/HDL-C without changes on HDL-C and T.G(6). Considering the observed deterioration of the Cardio vascular system and the metabolic profile that tends to accompany young men, it is important to know the potential benefits derived from the exercise. Although the effects of aerobic versus resistance training on Cardio vascular risk factors have been compared (7,8).

METHODOLOGY AND MATERIALS

Sixty sedentary individuals (21-25years) volunteered (mean (SD) age ± 22.5 (2) years) to participate in this study. Participants were informed about any potential risks and / or discomforts associated with participation in this study and were required to provide their written informed consent before being included

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in the study. Participants were randomized in to three training groups and one control group. All the participants were from the various colleges of Kurnool city under the Rayalaseema University, Kurnool, Andhra Pradesh, India.

AEROBIC BASED TRAINING GROUP (ABTG): the training was supervised by an exercise physiologist and the frequency was kept three times per weeks for 16 weeks with 45 minutes per session. The intensity of the main part of the session started with work heart rate (HR) 40-50% reserve (1st to 4th week) increasing progressively to 51-60% HR reserve (5th to 8th week), 61-70% HR reserve (9th to 12th week), 71-80% HR reserve (13th to 16th week).

RESISTANCE BASED TRAINING GROUP (RBTG): after an adequate warm-up the participants completed resistance exercise for three days a week for 16 weeks. They performed 8 exercises with elastic bands for the major muscular groups respecting the following progression

1 set of 8 repetitions (1st -2nd week) 1 set of 12 repetitions (3rd – 4th week)
2 sets of 8 repetitions (5th – 6th week) 2 set of 10 repetitions (7th-8th week)
2 sets of 12repetitions (9th -10th week) 2 sets of 15 repetitions (11th – 12th week)
3 sets of 12 repetitions (13th -14th week) 3 sets of 15 repetitions (15th -16th week) an interval period of at least 3 minutes was assured between sets of the same exercise.

INTERVAL BASED TRAINING GROUP: The experimental participants run a distance of 3.2 km 3 days per week for 16 weeks. Participants ran 4 sets of 800metres interval i.e. 4 X 800mts interval 1:1 work: rest ratio at approximately 60-70 of their age predicted maximal heart rate (HR Max 220-age in complete years)

CONTROL GROUP: The control group was instructed not to undertake any vigorous exercise during the training period.

MATERIALS: Venous blood samples were collected in the morning between 8 AM and 9.30AM by two specialized staff nurses before the training session and the blood samples has collected after completion of 16 week training session. LDL –C was determined using a direct two point Kinetic assay kit(CH2652, Randox, laboratories ,Ltd., U.K.).

STATISTICAL ANALYSIS: Analysis of Covariance technique was used to study the effect of the experimental variable on the selected physiological variables. Scheffe's post hoc test also applied to find out the source of significant difference among the groups and to test the hypotheses to arrive at conclusion. The level of significance was 0.05.

ANALYSIS ON LDL CHOLESTEROL

Table I depicts analysis of covariance for the LDL Cholesterol of the subjects on the experimental variable selected. The table indicates that there is significant effect through the selected experimental variable i.e. aerobic, resistance and yogasana's for the selected experimental period. The obtained F value i.e. 34.915 is much higher than the table F value i.e. 2.78 and hence the selected experimental variables caused the significant change in the selected LDL cholesterol levels of the subjects.

Table II contains the mean values of the selected criterion variable i.e. LDL Cholesterol of the subject. The table brings out the following observations. The aerobic running group showed better reduction in LDL cholesterol levels when compared to the other two groups viz. resistance and Interval Based Training Group. The aerobic running group's post training LDL cholesterol mean is 116.30, the resistance group's post training LDL Cholesterol mean is 121.7636 and the Interval Based Training Group post training LDL Cholesterol mean is 125.214. When compared with the mean values of the three groups, it is clear that the aerobic group showed significant reduction in LDL Cholesterol when compared to the other two groups. The resistance group also showed reduction in the LDL Cholesterol levels when compared to the Interval Based Training Group. This

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simple analysis on the post training adjusted mean values shows that there is significant reduction in the LDL cholesterol levels of the subjects due to the selected three activities at the selected intensity.

Table-I: ANCOVA TABLE

SOURCE	DF	SS	MS	F	CR.F
TOTAL	59	2849.847			
BG	3	1868.653	622.8845	34.91526	2.78
WG	55	981.1941	17.83989		

Table- II: Pre training, Post training and adjusted post training means for LDL Cholesterol

GROUPS	N	MX	MY	MY.X
IBTG	15	115.0667	109	125.2149
RTG	15	124.3333	114.2	121.7626
AG	15	136.4667	120.0667	116.3004
CG	15	153.8667	152.0667	132.0541
		132.4333	123.8333	123.833

Table III: Scheffe's Post Hoc test for LDLCholesterol CD FOR SCHEFFE'S TEST

CD=	√(a-1)F√((2(MsError)/n)) 4.355

INDIVIDUAL COMPARISONS FOR LDL CHOLESTEROL

GROUPS And VALUES	A G 116.3004	RBTG 121.7626	IBTG 125.2149
RBTG 121.7626	-5.4622 Sig		
IBTG 125.2149	-8.9447 Sig	-3.45227 n.sig	
CG 132.0541	-15.7537 Sig	-10.2915 sig	-6.83918 sig

Though there is variance in the mean values of the LDL Cholesterol because of the three protocols of the exercise, to find out the real difference and the cause of significant difference the Scheffe's post hoc individual comparison test was conducted.

The Scheffe's post hoc individual comparison test for the individual groups is presented in table III. The individual comparisons through the Scheffe's post hoc test elicited that the aerobic running group has brought out significant reduction in the LDL Cholesterol of the subjects when compared to the other two experimental protocols of exercise. The resistance and Interval Based Training Group post training adjusted averages are different in values, the Scheffe's post hoc comparison test indicated that the difference between the groups is insignificant and hence the training effect of the resistance and Interval Based Training Group is identical. But, all the three exercise protocol groups of the experimentation showed significant reductions in

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the LDL cholesterol levels as per the Scheffe's post hoc individual comparison test when compared to the Control group.

CONCLUSIONS AND RECOMMENDATONS

CONCLUSIONS:

The following conclusion has been derived after analyzing the experimentation results through the appropriate statistical tools:

1. All the three different protocols selected for the aerobic exercise capsule, anaerobic capsule and yogasana's capsule at the fifty to sixty percent maximal heart rate intensity caused for the significant decrease in the LDL cholesterol levels of the subjects.

RECOMMENDATIONS:

The following recommendations are offered by the scholar in this regard:

1. Aerobic exercise programs at a moderate intensity of 60-70% percent of the maximal heart rate of not less than four kilometers distance should be needed to better control the precipitating factors for the degenerative diseases like Coronary Heart Disease, Hypertension etc.
2. Similar study may be conducted cross sectionals for various populations changing the geographical limitations.
3. Same type of study may be done for various ages of the same geographical population or to the different geographical area population.
4. Similar study may be conducted for longitudinal studies with an increased experimentation period.
5. Many similar studies may be conducted changing the intensity factor of the experimentation exercise protocol.

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ANALYSIS ON THE EFFECT OF BRISK WALK ON THE AEROBIC CAPACITY AMONG 45-60 YEARS AGED PEOPLE

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Modern Technology has enabled the present day society to exist in a world where the concept of hard or even moderate physical work is almost obsolete. People are continuously looking for different ways to make life even easier. Particularly after the Second World War, in the past seven decades or so the rapid development of technology enabled man to lead almost an effortless life resulting in his Sedentary Life Style.

Sedentary life style is a medical term used to denote a type of lifestyle with no or irregular physical activity. A person who lives a sedentary lifestyle is colloquially known as a 'couch potato'. Sedentary life style is commonly found in both the developed and developing world. Sedentary activities include sitting, reading, watching television and computer use for much of the day with little or no vigorous physical exercise. For millions of years human beings moved their bodies in meaningful ways for all necessities and functions of life for both domestic chores and occupational activities. Modern lifestyle is ridden with domestic appliances like microwaves, robotic vacuum cleaners, washing machines, mixers, grinders, juicers and remotely controlled electronic gadgets that make life sedentary. Added to these, tinned precooked foods are robbing people of even meager physical activity.

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METHODOLOGY

The investigator randomly selected 100 sedentary men from Kurnool Town within the age group of 45-60 years. 50 subjects were assigned to an experimental group and 50 subjects to control group. Prior to the administration of test the investigator held a series of meetings with the subjects and made clear about the objectives and purposes of the test. The testing procedure was explained to them in detail. They were requested to co-operate and participate actively for the same.

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STATISTICAL TECHNIQUE:

Analysis of co-variance (ANCOVA) technique was used to study the effect of the selected experimental variables on the selected criterion variables. Scheffe's post hoc tests also applied to find out the source of the significant difference among the groups and to test the hypothesis.

AEROBIC CAPACITY

Purpose:The purpose of forestry step test was to measure the aerobic capacity.

Equipment: 33cm step bench.

Procedure: The subject was asked to stand facing 33cm step bench. On the command "Ready start". The subject steps up and down the bench to a four count rhythm as follows. On count on the subject stepped up on the bench. On count two the subject lifted the body up and placed the second leg. On count three any one of the legs is brought back to the floor and on count for the other foot is also lowered to the floor. The subject was allowed to begin with either foot. The subject was not permitted to step up with a jump and instructed to extend the knees fully when both the feet were on the bench. The stepping exercise was done for five minutes at the rate of 22 steps per minute. Immediately after the completion of exercise the subject was asked to sit down and after 15 seconds, the investigator started taking the pulse count at 5:15 (15 seconds after the test) and stopping at 5:30. The investigator recorded the pulse of the subject for duration of 15 seconds.

Scoring: The final score for each subject was calculated in terms of aerobic fitness index for men.

ADMINISTRATION OF TRAINING PROGRAMME

The experimental group had to undergo brisk walking every day for a period of three months. The control group did not involve in any fitness programme. The training was on the age group of 45-60 years. The walking programme included warm up (10 minutes), workout (40 minutes) and cool down (10 minutes) sessions for duration of 60 minutes. The intensity of walking was increased after every two weeks.

Table – I: BI-WEEKLY SCHEDULE OF BRISK WALKING PROGRAMME

Week	Distance in kilometers	Duration in minutes
First 2 weeks	2	20
2-4 weeks	2.5	25
4-6 weeks	3	30
6-8 weeks	3.5	35
8-10 weeks	4	40
10-12 weeks	4.5	45

COOL DOWN (10 MINUTES) : Neck sideward and backward stretching, arms stretching forward, backward, sideward, bending of upper body, hip rotation, calf stretching, hamstring stretching, heel walk, side step, lounge forward and sideward, heel up and down stretch, leg stretch and ankle rotation.

ANALYSIS & INTERPRETATIONS

The purpose of the study is to determine the effects of three months of brisk walking on selected physiological variables such as body aerobic capacity and flexibility of sedentary men.

The subjects of two groups were tested on selected 15 seconds. The pre test and post test means of 15 seconds of raining/experimental group and control group.

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TABLE – II: DIFFERENCE IN MEAN OF EXPERIMENTAL AND CONTROL GROUPS IN AEROBIC CAPACITY

Tests		Experimental Group	Control Group
Pre Test	Mean	38.28	38.76
	Standard Deviation	3.26	2.54
Post Test	Mean	35.56	38.92
	Standard Deviation	2.60	2.61

The Table-II shows that the pre test means values of experimental and control groups are 38.28 and 38.76 respectively; the post test means are 35.56 and 38.92 respectively. The table-II also shows that the pre test standard deviation values of experimental and control groups are 3.26 and 2.54 respectively; the post test standard deviations are 2.60 and 2.61 respectively.

The pre test and post test data on 15 seconds of experimental and control groups has been subjected to analysis of covariance and presented in the table –III.

TABLE – III: DIFFERENCE IN MEAN OF EXPERIMENTAL AND CONTROL GROUPS IN AEROBIC CAPACITY

Source	SS	DF	MS	F	F
Adjusted Means	222.83	1	223.83.	47.4	3.54
Adjusted Covariance	459.03	97	4.7	-	-
Adjusted Total	682.85	98	-	-	-

TABLE – IV Adjusted post test means

Experimental Group	Control Group	Mean Difference	Confidential Critical Value
35.71	38.77	3.06	2.1

The table-IV indicates that the mean difference between experimental and control group is 3.06 and the mean difference value is greater than the critical difference value 2.1. It shows significant difference between the above paired means in systolic pressure.

CONCLUSIONS

The results of the study seem to permit the following conclusions.

1. Participation in three months of Brisk Walking resulted in improvement of aerobic capacities.
2. Body weight was reduced as a result of participating in three months brisk walking.
3. Resting pulse rate is reduced as a result of participation in three months brisk walking.
4. Participation in three months brisk walking resulted in reduction of percentage of body fat.
5. Flexibility was improved in sedentary men as a result of three months brisk walking.
6. Participation in three months brisk walking resulted in considerable lowering of blood pressure.

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RECOMMENDATIONS

In the light of conclusions drawn the following recommendations are made.

I. Similar studies may be under taken with age group and sex other than mentioned in this study.
II. Similar longitudinal studies may be undertaken by increasing the duration and intensity of training programme.
III. Similar studies may be undertaken to understand the effect of walking programme on sedentary diabetic men.
IV. Similar studies may be made by increasing the subjects to a large number.

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PHYSICAL EDUCATION AND SPORT IN SCHOOLS: A REVIEW OF BENEFITS AND OUT COMES

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ABSTRACT

This paper explores the scientific evidence that has been gathered on the contributions and benefits of physical education and sport (PES) in schools for both children and for educational systems. Research evidence is presented in terms of children's development in a number of domains: physical, lifestyle, affective, social, and cognitive. The review suggests that PES have the potential to make significant and distinctive contributions to development in each of these domains. It is suggested that PES have the potential to make distinctive contributions to the development of children's fundamental movement skills and physical competences, which are necessary precursors of participation in later lifestyle and sporting physical activities. They also, when appropriately presented, can support the development of social skills and social behaviors, self-esteem and pro school attitudes, and, in certain circumstances, academic and cognitive development. The review also stresses that many of these benefits will not necessarily result from participation, the effects are likely to be mediated by the nature of the interactions between students and their teachers, parents, and coaches who work with them. Contexts that emphasize positive experiences, characterized by enjoyment, diversity, and the engagement of all, and that are managed by committed and trained teachers and coaches, and supportive and informed parents, significantly influence the character of these physical activities and increase the likelihood of realizing the potential benefits of participation.

INTRODUCTION

Advocates of physical education and sport (PES) have listed numerous benefits associated with participation in these activities. For example, Talbot claims that physical education helps children to develop respect for the body—their own and others', contributes toward the integrated development of mind and body, develops an understanding of the role of aerobic and anaerobic physical activity in health, positively enhances self-confidence and self-esteem, and enhances social and cognitive development and academic achievement.[1] Writing specifically about sport, a Council of W.H.O report suggests that it provides opportunities to meet and communicate with other people, to take different social roles, to learn particular social skills (such as tolerance and respect for others), and to adjust to team/collective objectives (such as cooperation and cohesion), and that it provides experience of emotions that are not available in the rest of life. This report goes on to stress the important contribution of sport to processes of personality development and psychological well-being, stating that there is, ''strong evidence. on the positive effects of physical activities on self-concept, self-esteem, anxiety, depression, tension and stress, self-confidence, energy, mood, efficiency and well-being.''[2] Such claims have often been criticized for lacking empirical foundations and for confusing policy rhetoric with scientific evidence.[3] This paper seeks to explore some of the scientific evidence that has been gathered on the contributions and benefits of PES for both children and for educational systems.

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In doing so, it will be using a framework and some of the data derived from a recent international research project,[4] which drew evidence from over 50 countries, including a meta-analysis of statements of aims and standards, and national curricula.[5] Findings suggest that the outcomes of PES can be understood in terms of children's development in 5 domains:

1. Physical 2. Lifestyle 3. Affective 4. Social and 5. Cognitive

As its title suggests, this article is concerned with ''physical education and sport.'' Since the relationship between the concepts ''physical education'' and ''sport 'continues to be a cause of debate,[6] it is worthwhile clarifying the use of the terms in this review. In many, predominantly Anglophone, countries, the term ''physical education'' is used to refer to that area of the school curriculum concerned with developing students' physical competence and confidence, and their ability to use these to perform in a range of activities.[7] ''Sport'' is a collective noun and usually refers to a range of activities, processes, social relationships, and presumed physical, psychological, and sociological outcomes.[8] In this presentation, there appears to be a relatively clear conceptual distinction between these 2 terms. However, cross-cultural studies have revealed significant differences in the use of terminology in this area, and many educational systems use the terms synonymously, or simply use ''sport'' as a generic descriptor.[9] For this reason, and in line with international agencies like the United Nations Educational, Scientific and Cultural

PHYSICAL DEVELOPMENT

PES in school is the main societal institution for the development of physical skills and the provision of physical activity in children and young people.[11] For many children, school is the main environment for being physically active, through either PES programs or after-school activities.[12] There is evidence that for a growing number of children, school provides the main opportunity for regular, structured physical activity as a combination of economic pressures[13] and parental concerns for safety[14] means that fewer children are able to play games in nonschool settings. Moreover, school-based PES offers a regulated opportunity for usually qualified, accountable teachers to introduce physical activities and lifestyle skills and knowledge in a structured way to all children, within a safe and supportive environment.[15] The physical health benefits of regular physical activity are well established.[16] Regular participation in such activities is associated with a longer and better quality of life, reduced risk of a variety of diseases, and many psychological and emotional benefits.[17] There is also a large body of literature showing that inactivity is one of the most significant causes of death, disability, and reduced quality of life across the developed world.[18] Evidence is starting to appear suggesting a favorable relationship between physical activity and a host of factors affecting children's physical health, including diabetes, blood pressure,[19] bone health,[20] and obesity.[21]Basic movement skills, like those developed in PES, form the foundation of almost all later sporting and physical activities.[22] There is evidence that those who have developed a strong foundation in fundamental movement skills are more likely to be active, both during childhood and later in life.[23] There is also a frequently cited, but under researched, hypothesis that the development of a broad range of these basic movement skills through PES programs is a necessary condition for excellence in sport. Conversely, children who have not been able to acquire an adequate base of movement competences are more likely to be excluded from participation in organized sports and play experiences with their friends because of a lack of basic physical skills. So, as one of the most highly valued aspects of many children's and young people's lives, such omission from the activities that make up PES is likely to have far-reaching and harmful consequences to the development and education of many children.

LIFESTYLE DEVELOPMENT

Physical inactivity has been identified as a major risk factor for coronary heart disease, as well as being associated with premature mortality and obesity. It is not surprising, then, that PES programs — some of

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the few opportunities to promote physical activities amongst all children — have been proposed as a cost-effective way to influence the next generation of adults to lead physically active lives. The mechanisms by which active young people become active adults are unclear. However, research suggests that a number of factors contribute to the establishment of physical activity as part of a healthy lifestyle. There is some evidence that health-related behaviors learned in childhood are often maintained into adulthood. The extent to which physical activity patterns are maintained over time is less clear. The Amsterdam Growth Study did not find evidence of tracking of physical activity from 13 and 27 years. Other studies, however, have found that youth activity carries on into later life. A review of retrospective and longitudinal studies reported that physical activity and sports participation in childhood and youth represents a significant predictor of later activity. Interestingly, studies also show how strongly inactivity in youth tracks to adulthood,[35] so exclusion from PES can be associated with a legacy of inactivity and associated ill-health in the years to come. There have been frequent claims that school PES create important contexts in which physical activity levels are influenced. Studies have found that school-based programs can contribute to physical activity levels, both during youth and later in life. The potency of PES' influence on physical activity seems to be greatest when programs combine classroom study with activity, when they allow students' experiences of self-determination and feelings of competence in their own abilities, and when they emphasized enjoyment and positive experiences.

AFFECTIVE DEVELOPMENT

There is now fairly consistent evidence that regular activity can have a positive effect upon the psychological well-being of children and young people, although the underlying mechanisms for explaining these effects are still unclear. The evidence is particularly strong with regards to children's self-esteem.[42,43] Other associations with regular activity that have been reported include reduced stress, anxiety, and depression. All of these lend support to the claim that well-planned and presented PES can contribute to the improvement of psychological health in young people. One especially relevant set of findings, in this regard, relates to the development of perceived physical competence. It has been suggested that self-esteem is influenced by an individual's perceptions of competence or adequacy to achieve, and that It is also worth considering the growing interest in the relationship between PES and students' general attitudes toward school. The evidence supporting such claims is limited and is mostly based on small-scale studies or anecdotal evidence. However, some studies report generally positive outcomes in terms of pupil attendance following the introduction of PES schemes, and there is evidence from studies of pupils at risk of exclusion from school that an increase in the availability of PES programs would make the school experience more attractive. On the theme of the relationship between PES and attitudes to school, it ought to be acknowledged that not all pupils enjoy such activities, at least when presented in certain ways. For example, many girls acquire a progressive disillusionment with certain aspects of PES and totally disengage from participation as they move through secondary schooling. So it would be misleading to suggest that PES will necessarily contribute toward positive attitudes to school in all pupils as inappropriate provision might actually increase disaffection and truancy. More positively, though, there is a great deal of research showing that when PES activities are presented in attractive and relevant ways to girls, they can enjoy participation as much as boys.

SOCIAL DEVELOPMENT

The idea that PES positively affect young people's social development and prosocial behavior goes back many years. PES settings are considered an appealing context because both naturally occurring and contrived social interactions frequently emerge and because the public nature of participation usually makes both socially appropriate and inappropriate behaviors evident. The research literature on the relationship between PES and social development is equivocal. It does not seem to be the case that pro social behavior necessarily improves as a result of engagement, and there is evidence that in some circumstances behavior

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actually worsens. However, numerous studies have demonstrated that appropriately structured and presented activities can make a contribution to the development of pro social behavior and can even combat antisocial and criminal behaviors in youth. The most encouraging findings come from school based studies, especially those focusing on PES curriculum programs. While a wide range of physical activities seem able to offer valuable environments for social development, school-based programs have a number of advantages, such as access to nearly all children, fewer external pressures to emphasize outcome and competition, and the ability to integrate social education with the similar teaching across the school curriculum. Intervention studies have produced generally positive results, including improvements in moral reasoning, fair play and sports person ship, and personal responsibility. It also seems that the most promising contexts for developing social skills and values are those mediated by suitably trained teachers and coaches who focus on situations that arise naturally through activities, by asking questions of students and by modeling appropriate responses though their own behavior. Of related concern is the issue of social inclusion and exclusion. Combating social exclusion, or the factors resulting in people being excluded from the normal exchanges, practices and rights of modern society, has become a focus of attention for governments and nongovernment organizations in recent years. Some writers have argued that PES not only reflects but can also contribute to some groups' social exclusion. However, positive experiences do seem to have the potential to, at least, contribute to the process of inclusion by bringing individuals from a variety of social and economic background together in a shared interest, offering a sense of belonging to a team or a club, providing opportunities for the development of valued capabilities and competencies, and developing social networks, community cohesion, and civic pride.

COGNITIVE DEVELOPMENT

There is a long tradition claiming that a ''healthy body leads to a healthy mind,'' and that physical activity can support intellectual development in children. However, there is also an increasing concern by some parents that, while PES has its place, it should not interfere with the real business of schooling, which many believe to be academic achievement and examination results.[71] Researchers have suggested that PES can enhance academic performance by increasing the flow of blood to the brain, enhancing mood, increasing mental alertness, and improving self-esteem. The evidence base of such claims is varied and more research is still required. However, existing studies do suggest a positive relationship between intellectual functioning and regular physical activity, both for adults and children. The classic study of the relationship between PES and general school performance was carried out in France in the early 1950s. Researchers reduced ''academic'' curriculum time by 26%, replacing it with PES; yet, academic results did not worsen, and there were fewer discipline problems, greater attentiveness, and less absenteeism. Morerecent studies have found improvements for many children in academic performance when time for PES is increased in their school day. A review of 3 large-scale studies found that academic performance is maintained or even enhanced by an increase in a student's levels of PES, despite a reduction in the time for the study of academic material.Overall, the available research evidence suggests that increased levels of physical activity in school—such as through increasing the amount of time dedicated to PES—does not interfere with pupils' achievement in other subjects (although the time available for these subjects in consequently reduced) and in many instances is associated with improved academic performance.

CONCLUDING COMMENTS

Clearly, PES have the potential to make significant contributions to the education and development of children and young people in many ways, although further research and evaluation will help us better understand the nature of these contributions. Nevertheless, in each of the domains discussed—physical, lifestyle, affective, social, and cognitive—there is evidence that PES can have a positive and profound effect. In some respects, such an effect is unique, owing to the distinctive contexts in which PES take place.

Consequently, there is a duty for those who teach and acknowledge the value of PES to act as advocates for its place as a necessary feature of the general education of all children. They need to argue not just for the inclusion of PES within the curriculum, and for the provision of sufficient time, but also to stress the importance of the quality of the program and share information on the benefits of PES among administrators, parents, and policy makers. A note of caution should be sounded, too. The scientific evidence does not support the claim that these effects will occur automatically. There is no reason to believe that simply supporting participation in PES will necessarily bring about positive changes to children or to their communities. The actions and interactions of teachers and coaches largely determine whether or not children and young people experience these positive aspects of PES and whether or not they realize its great potential. Contexts that emphasize

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AEROBIC AND ANAEROBIC CAPACITY AMONG INTERVARSITY LEVEL KHO – KHO AND KABADDI PLAYERS-A COMPARATIVE STUDY

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ABSTRACT

The purpose of the study was to compare the aerobic and anaerobic capacity of Intervarsity level Kho – Kho and Kabaddi players of Krishna University, Andhra Pradesh. To achieve the set objective, twenty four(n=24) male players(Kho-Kho=12 and Kabaddi=12) of Indian Indigenous games were selected from Krishna University, Andhra Pradesh. Data was collected during University coaching camps of the two games for their respective participation in Inter University tournaments. The age of the subjects range from 19-26 years.

Total two variables aerobic and anaerobic capacity was selected for this study. Aerobic capacity was measured by the performance of 600 yard run/walk on standard track with the help of stop watch in second/minute. Anaerobic capacity was measured by the performance of 50 yard dash in seconds. Mean and standard deviation of each variable was calculated. The means of the respective variable between two games were compared by using 't'-test. Statistical significance was tested at 0.05 level of confidence. For statistical calculations Excel Spread sheet of windows verson7 was used. The result showed high significance in both variables of aerobic and anaerobic capacity among Kho-Kho and Kabaddi players. The result of the study showed that Kho-Kho players were significantly better than kabaddi players in compare with aerobic and anaerobic capacity. This study provides base information for devising training module for enhancement of performance of the players of the two Indian Indigenous games.

Key words: Aerobic capacity. Anaerobic capacity, standard track, Indigenous games.

INTRODUCTION

Kho – Kho and Kabaddi are two very popular games in the south Asian countries today.Both the game has increasing trend of popularity in the western countries and few American and African countries as well. Both the games are considered as small area games. The games are simple in nature, easy to organize and less expensive, hence, reach to common men. Both games required less equipment. Kabaddi is most aggressive and highly body contacts game, but Kho – Kho is a semi contact games. Both games different from each other in their nature, skills, techniques and strategies etc. So there are some similarity and dissimilarity as well between Kho – Kho and Kabaddi games.

In today's competitive world of sports the Physiological fitness of a team or player is required than any other aspect. Since every sports has a different Physiological demand on the body depending upon the nature, intensityand duration of the games and activity, the Kho – Kho and Kabaddi players fitness must be developed accordingly to bring out the best possible performance of a team or athlete.

According exercise Aerobic literally means "Living in air", and refers to the use of Oxygen to adequately meet energy demands during exercise via aerobic metabolism. The word 'anaerobic' literally means "without Oxygen". Anaerobic exercise means you are working at such a high level of intensity, that the cardiovascular

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system can't deliver oxygen to the muscles fast enough. Because muscles need oxygen to continue exercises only last for short periods of time. The assessment of Physiological work capacity is a major consideration in preparing athletes for many sports games appears to include high anaerobic power alone.

Purpose of the Study:

The purpose of the study was to compare the aerobic and anaerobic capacity of Intervarsity level Kho – Kho and Kabaddi players.

1) Delimitations

I. The study was delimited to male Kho – Kho and Kabaddi players,
II. The study delimited to intervarsity level Kho – Kho and Kabaddi games only,
III. Subject age was delimited to 19-26 years, and
IV. The study was also delimited only 12 players in each group.

2) Limitations

I. Diet, health, habits and living style of the subjects cannot be controlled, and
II. They would have been in activities of their own choice their timetables should not be controlled.

3) Objectives of the Study

I. To collect data about aerobic and anaerobic capacity of male Kho –Kho Players.
II. To collect data about aerobic and anaerobic capacity of male Kabaddi Players.
III. Comparison the aerobic and anaerobic capacity among Kho –Kho and Kabaddi Players.

4) Significances of the problem

I. A comparison about the aerobic and anaerobic capacity of male intervarsity level Kho –Kho and Kabaddi players can be scanned out from this study.
II. The study may help in planning the training programmes of male intervarsity level Kho –Kho and Kabaddi players.
III. The results of the study may be helpful for self – assessment of male intervarsity level Kho –Kho and Kabaddi players.

Methodology

Design of the study: For the present study the sample has been selected from Krishna University Kho-Kho and Kabaddi coaching camps. Twelve male Kho – Kho and Twelve male Kabaddi players has been selected for this study. Test has been conducted on the both groups to collect the data of selected variables. To analyses of data't' – ratio has been used. Statistical significance was tested at 0.05 level of confidence.

Selection of the subject: These subjects for this study were selected from Krishna University, Andhra Pradesh, Kho – Kho and Kabaddi teams. A total number of 24 male players, 12 each from Kho – Kho and Kabaddi were selected. The age of the subject range from 19-26 years.

Selection of the variables: Selection of the variables for the study was aerobic capacity and anaerobic capacity.

Criterion measures: The following tests were selected and their course was considered as Criterion measures of this investigation.

I. Aerobic capacity was measured by 600 yard run / walk test. The score was that time elapsed in the nearest $1/10^{th}$ of a second/minute.
II. Anaerobic capacity was measured by 50 yard dash. The score was that time elapsed in the nearest $1/10^{th}$ of a second.

Administration of the Test: The data were collected for each variable by administering their respective tests. The tests were administered in the University coaching venues i.e Vijayawada. Sufficient trails were given to each subject. The tests were explained to the subjects prior to their administration.

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Statistical Procedure: The collected data was analysed by using Independent Sample't' – test to compare the aerobic and anaerobic capacity of intervarsity level male Kho – Kho and Kabaddi players.

Results

The results of the study has shown that Kho – Kho players are having good aerobic and anaerobic capacity than Kabaddi players.

Discussion of Findings

Table – 1: Mean standard Deviation, Standard Error Mean and t – ratio of aerobic capacity among Kho – Kho and Kabaddi players in 600 yards run and walk test.

Results of 600 yards run & walk	N	Mean (min)	Standard Deviation	Standard Error Mean	t	df	Sig. (2- Tailed)
Kho – Kho players	12	1.59	0.038	0.011	-8.09	22	0.000
Kabaddi Players	12	1.73	0.049	0.014			

It appears in the table – 1 that mean, standard deviation and standard error mean of Kho – Kho players are 1.59, 0.038 and 0.011; Kabaddi players are 1.73, 0.049 and 0.014 respectively in relation to their aerobic capacity. The Kho – Kho players are having the better aerobic capacity i.e. 1.59 minute compare the Kabaddi players are 1.73 minutes, there is a difference -0.14 minute. The t- value is -8.09. From the table -1 it was found that statistically significant Difference exits at 0.05 level of confidence between Kho – Kho game than Kabaddi game and the quantum of aerobic running is more involved in Kho – Kho games and Kabaddi games and the quantum of aerobic training done in preparatory phase which helps in improvement of oxygen supply to the muscles.Aerobic capacity of Kho –Kho Players are better compared to kabaddi players may be for other Aerobic capacity of Kho –Kho field area is bigger than the Kabaddi field area. Thus while players may be for other reasons that Kho – Kho players cover more distance by running skills are much dominating throughout the game. In Kho – Kho game a team of nine players chases the defenders run with maximum speed not to be put out. Similarly findings were made by Haque& Ghosh, (2014) and Singh (2013).

Table – 2: Mean standard Deviation, Standard Error Mean and t – ratio of anaerobic capacity among Kho – Kho and Kabaddi players in 50 yards dash test.

Results of 50 yards dash	N	Mean (sec.)	Standard Deviation	Standard Error Mean	t	df	Sig. (2- Tailed)
Kho – Kho players	12	6.88	0.081	0.023	-5.25	22	0.000
Kabaddi Players	12	7.04	0.076	0.022			

It appears in the table –2 that mean, standard deviation and standard error mean of Kho – Kho players are 6.88, 0.081 and 0.023; Kabaddi players are 7.04, 0.076 and 0.022 respectively in relation to their aerobic capacity. The Kho – Kho players are having the better anaerobic capacity of Kho - Kho Players was better than the Kabaddi players. The Kho – Kho players are having the better anaerobic capacity i.e. 6.88 seconds compare the Kabaddi players are7.04 seconds, there is a difference 0.16 seconds. The t- value is -5.25. From the table -2 it was found that statistically significant Difference exits at 0.05 level of confidence between Kho – Kho game than Kabaddi game and the quantum of anaerobic capacity because the movement patterns observed in Kho – Kho

game is rapd, quick, faster, explosive, durative and frequency changed in movement direction that required more speed, leg strength, cardio respiratory endurance and agility than in Kabaddi game which is basically a game that dominated muscular strength. This results is consonance with the study of panel &Datta(2014).

Conclusion

Within the limitations of the study following conclusions may be drawn:

I. In aerobic and anaerobic capacity Kho – Kho players are better to kabaddi players,

II. This type of Study is useful to the coaches and physical education teachers to enhance the aerobic and anaerobic capacity among Kho – Kho and Kabaddi players of their teams.

III. Similar Study can be conducted on the national teams as well as other sports and games also.

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THE EFFECT OF PLYOMETRIC TRAINING ON PHYSICAL, PHYSIOLOGICAL, HEMATOLOGICAL VARIABLES AND ON SELECTED SKILLS OF VOLLEY PLAYERS

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ABSTRACT

This study aim to identity the effectiveness of plyometric exercises on the special physical abilities and skillful performance of volleyball players. It is applied to a sample of 90 players of 14 & 15 years old from Z.P. High School, Tiruchanoor, Tirupati Rural, Chittoor Dist., A.P. They were divided into three (3) equivalent groups experimental group I underwent type I intensity plyometric training and experimental group II underwent type II intensity plyometric training and control group will not exposed any training. The training programme is applied for the period of 12 weeks with 2 training units at 90 minutes for each unit. The load will fixed based on the pilot study. Analysis of covariance statistical technique is used for this study.

INTRODUCTION

This term is used to describe the method of training which seeks to enhance the explosive strength of the individual through powerful muscular contraction as a result of rapid eccentric contraction. It include both depth jumping, hopping & bounding drills. They are very dynamic movements which use gravitational force of the body and the contractibility & elasticity of muscle tissue to increase the force or stress on related muscles. A form of exercise that involves rapid and repeated stretching contracting of the muscles designed to increase strength. In today's age of scientific knowledge man is making rapid progress in all walks of life and it is true in the area of games & sports.

Although plyometric training has received much attention recently, it had been part of the training of athletes in a variety of sports for years. It is used in conjunction with other power development methods in a complete training programme to bridge the gap between maximum strength and explosive power. Scientific research has given us a fundamental understanding of the elastic properties of muscles and its training ability.

Plyometric exercises increase strength & explosive speed, while reducing reaction time. It will help move faster in the court, and jump higher at the net.

STATEMENT OF THE PROBLEM

The purpose of the present study is to find out the effect of plyometric training on selected skills of volley ball game among school levels students.

SIGNIFICANCE OF THE STUDY

The study is significant in making an attempt to find out the effect of plyometric training on strength, speed and vertical jumping ability. The result may help the coaches & Physical educationists to select appropriate coaching drills to improve their wards jumping & spiriting ability especially in the schools which are the basis for the further performance.

HYPOTHESIS

On the basis of the available literature, experts opinion & scholars own understanding of the problem, it is hypothesized that the ploymetric training may increase strength speed and vertical jump performance of the

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selected subjects. It is also hypothesized that the varied ploymetrics may significantly improve the physical physiological and hematological variable among school level students.

DELIMITATIONS

The study will be delimited to the following aspects.

1. This study will be conducted on 90 school level boys with the age groups is ranged from 14 and 15 years.
2. The experiment will be conducted on the subjects who have participated at zonal level competitions ZPHS, Tiruchanoor, Tirupati Rural, Chittoor District.
3. The training will be only for a duration of 12 weeks.

LIMITATIONS

1. The physiological factors, such as diet & nutritive practice were not to taken into consideration.
2. The investigator did not consider the difference in humidity temperature and other environmental conditions at the time of pre & post test.
3. Regular activates and day to day affairs of the subjects were not taken into consideration such as sleeping, studying etc.

METHODOLOGY

In this chapter selection of subjects, selection of variables orientation of the subjects, selection of the tests, experimental design, construction of training performance collection of the data & statistical techniques for the analysis of the data have been presented.

SELECTION OF THE SUBJECTS & VARIABLES

The sample for the present study consisting of 90 school level volley ball players were selected from Z.P.H.S. Tiruchanoor, Tirupati (Rural), Chittoor District. The subjects were selected using random sampling method. Their age ranged between 14 and 15 years. They were divided into 3 equal groups Experimental group-I, underwent type II intensity plyometric training and experimental group-II, underwent type-II intensity plyometric training and control group will not exposed to any training. The training for the period of 12 weeks 3 days per week in the morning. The load will fixed based on the pilot study. The pre test and post test were taken before and after the training programme. Analysis of covariance statistical techniques is used for this study.

Definition of the Terminology

1. Plyometrics: Is type of exercise that uses explosive movements to develop muscular power. A form exercise that involves rapid and repeated stretching and contracting of the muscles designed to increase strength jumping and rebounding to increase muscle power.

2. Vollye ball: Was invented in 1895 by William G. Morgan in Holyoke, Mass, Game played by two teams of 6 players each, in which an inflated ball is volleyed over a high net. A team is allowed to touch the ball three times before returning it competitions began in 1913 and volley ball became an Olympic sport in 1964.

3. Strength: The force are tension developed by a muscle (or) group of muscles again resistance in one maximal contraction or ability to postpone (or) sustain fatigue (Carl E. Klays & Daniel D. Arnhein, 1963).

4. Speed: Speed is a combination reaction time and movement time. The ability to move the whole body or parts of it from one point to another as quickly as possible (A. Ghosh)

Reaction time: is it takes you to respond to a stimulus Ex: Goali responding to a shot in foot ball.

Movement time : Is the time it takes to perform a movement. Ex: Sprinting to catch an opponent.

5. Power: Speed × strength – power is basically strong movements, performed with speed. Ex: Shooting in foot ball, smashing in badminton and tennis.

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6. Vertical jump: A vertical jump or vertical leap is the act of raising one's center of gravity higher in the vertical plane solely with the use of one's own muscles; it is measure of how high an individual or athlete can elevate off the ground (jump) from a standstill

7. Agility: Is the ability to move and change direction and position of the body quickly and effectively while under control

8. Flexibility: Ability to execute movement with greater rate when the body in movement (or) range of movement aground a joint.

9. Endurance: Ability to do sport movement under conditions of fatigue.

Physiological variables

1. Vital capacity: Is the volume of air that can forcibly be blown out after full inspiration.

2. Stroke volume: The amount of blood pumped by the left ventricle of the heart in one contraction.

Hematological variables

1. Red blood corpuscles
2. White blood corpuscles

Selection of Variables

Dependent variables

i. Physical variables

Name of the variable	**Name of the test**
Strength	Pulling, pushing & bench press, hand grip strength test. (John Brookfield & Rob wood) To measure the maximum isometric strength of the hand and forearm muscles. Equipment Required: Hand grip dynamometer
Speed	50 mts sprint Sprint test: 50 meters sprinting test (IPFT International Physical Fitness Test – USA sports academy & council for the youth in sports.
Vertical jump	Vertical jump test: Sargent jump test was developed by Dr. Dudley Allen sergeant (1849-1924).

ii. Physiological variables

Name of the variable	**Name of the test**
Vital capacity	Wet or regular spirometer
Stroke volume	Echocardiogram

iii. Hematological variables

Name of the variable	**Name of the test**
Red blood corpuscles	Blood test
White blood corpuscles	Blood test

Independent variables

Volley skills: Spiking and Jump service

Selection of Independent variables

Type – I Intensity Plyometric		**Programme**
Standing Jumps	:	1. Standing broad jump 2. Standing jump and reach
Multiple jumps	:	1. Zigzag drill 2. Stadium hops

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Box drills	:	1. Front box jump
		2. Lateral box jump
Type –II Intensity Ploymetric Programme		
Depth Jumps	:	1. Jump from box
		2. Jump to Box
Bounding	:	1. Skipping
		2. Power skipping
Medicine ball exercises	:	1. Medicine ball pushups
		2. Medicine ball squat jumps

Statistical technique

Analysis of co-variance (ANCOVA) statistical techniques is used for this study.

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CONSTRAINTS OF INDIAN WOMEN PARTICIPATION IN GAMES AND SPORTS

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ABSTRACT

Female of 18 - 22 aged groups and psycho- social and socio-economic status do face a number of constraints in pursuing physical recreation activity. The problem under investigation was a study on the constraints of women participation in sports in India. The present paper aimed to study the constraints of female's physical recreation participation, and the relationship of perceived constraints and the level of participation between different education levels that was graduation and post- graduation. Two hundred and eight females aged 18 to 22 were invited to fill in the Physical Recreation Participation Questionnaire (PRPQ) to identify their perceived constraints and level of physical recreation participation. Results indicated that there were certain constraints factors, such as psychological constraints, accessibility constraints and time constraints, more related to the constriction in female physical recreation participation. When analyzing the constraint dimensions with different status towards participation frequency, the result was not necessary negatively related. The population under this study was college women who were studying Degree and post graduates in the Arts, Science under Sri Krishnadevaraya University, Anantapuramu, Andhra Pradesh, India. Sample was thousand women of 25 colleges were selected randomly. There has been lack of encouragement from the parents and family members. Statistically significant differences ($p<05$) were found in the awareness factors ($F=4.70$, $p<05$), accessibility factors ($F=2.81$, $p<05$), and time factor ($F=3.41$, $p<05$) among different physical recreation participation frequency groups.

INTRODUCTION

Karl and Ginder (2015) defined physical recreation as "freely chosen, enjoyable activity, which involves movement of the body and includes active sport, exercise, fitness, dance, and outdoor activities". When considering constraints in physical activity participation, there were many definitions on leisure constraints, nevertheless, they all shared the similar ideas: Constraints have been defined as those factors that make physical activity participation unattractive and impede consistent participation (Yeswanth and Ledgon 2014). In spite of the different grouping of leisure constraints, it has been widely presumed in the early researches that there was a negative relationship between constraints and leisure participation, while constraints inhibited people's participation in physical activity. Sisnor and Dewar (2013) study, it pointed out controversial idea that activity participation might disclose individual to constraints they did not forecast. Moreover, participants might have learned to overcome constraints or how to change their activity participation to face those constraints.

Regarding the constraints faced by female in leisure participation, it is proposed that although female have leisure, they faced more constraints than men did. Substantial researches had linked constraints on female's leisure with their position within a patriarchal society (Shaw,2013). Furthermore, among those constraints thought to be significantly more prevalent within female leisure participation, gender-role conformity, family and time commitment and the ethic of care had probably received the most attention in the literature.

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Methodology

Subjects

208 females aged 18-22 were invited to fill in the PAPQ. The population under this study was college women who were studying Degree and post graduates in the Arts, Science under Sri Krishnadevaraya University, Anantapuramu, Andhra Pradesh, India. The Level of physical activity participation was categorized according to their self-reported physical recreation participation in the academic year of 2013 - 2014. The sample comprised of 30.3% frequent participant (at least once a week), 13.9% moderate participant (at least once a month), 34.6% infrequent participant (less than once a month) and 21.2% non-participant (didn't participate at all).

Data Analysis

All data were analyzed by the Statistical Package for Social Science for Window 9.0 version. Mean and standard deviations were calculated between different participant groups (infrequent, moderate, and frequent participants) in the seven constraint factors. One-way analysis of variance (ANOVA) was used to compare the differences among different psycho-social-demographic groups. Two-way ANOVA was further adapted to analysis the interaction effect for the demographic differences (occupation status, education level and marital status) respectively in total constraints toward physical recreation participation frequency.

Results

Regarding the constraint dimension, mean scores and standard deviation were reported on Table 1 with "Time Factors" ranked first in the constraint dimensions. In terms of the mean differences of particular constraint dimensions, One-way ANOVA analysis was shown on Table 2. Statistically significant differences ($p<05$) were found in the awareness factors ($F=4.70$, $p<05$), accessibility factors ($F=2.81$, $p<05$), and time factor($F=3.41$, $p<05$) among different physical recreation participation frequency groups.

Furthermore, there was significant interaction relationship between total constraints and education level on physical recreation participation ($F=2.91$, $p<05$). There was significant mean difference in the main effect for total constraints ($F=6.64$, $p<05$). Multiple comparison tests results were shown on Table 3 and Table 4 respectively. The result indicated that under the occupation status, housewives ($M=2.11$) scored significantly lower total constraint scores than the full-time ($M=2.79$) and part-time ($M=3.08$) respondents. Furthermore, there was significant difference in the main effects for the total constraints ($F=7.01$ $p<.05$). Furthermore, in terms of the education level, respondents with education level ($M=2.04$) scored significantly lower total constraints scores than those have primary ($M=2.71$), secondary 3 ($M=3.11$), post secondary ($M=2.47$) and college ($M=3.13$) education level.

Table 1. Ranking of 7 Constraint Dimensions towards Physical Recreation Participation (N=7) (in descending order).

Rank	Constraint Dimensions	M	SD
1	Time Factor	2.98	.99
2	Lack of Partners	2.77	.006
3	Facility Factors	2.56	.006
4	Accessibility Factors	2.54	.006
5	Awareness Factors	2.08	.005
6	Un-enjoyable Past Experiences	2.12	.005
7	Psychological Factors	1.96	.004
	Total Constraint Factors	2.37	.004

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Table 2. One-way ANOVA for the Perception of Constraint Factors by Participation Groups.

	Group						
	Non-participant	Infrequent Participation	Moderate participation	Frequent participation	df	F	sig.
Psycho- Social factors	2.16	1.88	1.99	1.88	3	2.28	.080
Awareness Factors	2.40	1.84	1.97	2.20	3	4.70	.003
Facility Factors	2.85	2.55	2.46	2.40	3	2.52	.059
Accessibility Factors	2.61	2.67	2.68	2.27	3	2.81	.041
Past Experience	2.38	2.03	2.03	2.07	3	1.94	.125
Partner Factors	2.92	2.92	2.57	2.60	3	2.08	.104
	3.15	3.15	3.00	2.67	3	3.41	.019
Time Constraints	2.59	2.36	2.35	2.25	3	2.85	.039

Table 3. Interaction between Constraint Factors and Occupation Status for Physical Recreation Participation (Two-Way ANOVA) (N=208).

Source of Variation		Sum of square	Mean Square	df	F	sig
2-way interation	Total constraints* occupation status	24.24	3.46	7	3.68	.001
Main Effects	Total constraints	20.00	6.67	3	7.01	.000
	Occupation status	.324	.108	3	.115	.951

Table 4. Interaction between Total Constraint and Education Level on Physical Recreation Participation (Two-Way ANOVA) (N=208).

Source of Variation		Sum of Square	Mean Square	df	F	sig
2-way interation	total constraints* occupation status	24.48	3.72	9	2.91	.003
Main Effects	total constraints	18.63	6.21	3	6.64	.000
	occupation status	1.20	1.20	4	.32	.864

DISCUSSION

`Lack of time' is a common constraint factor obtained in physical activity research, which also shown in the present study. Female perceived their infrequent physical activity participation was caused by the lack of

time. Although lack of time can be described as "real" barrier inhibiting participation, Burton and Raedeke (2010) suggested that lack of time might not be an absolute constraint, but rather, a reflection on a person's attitudes toward physical activity.

In response to time constraints for recreation activity participation, female were more constrained when compared to men, with regard to household obligations and family commitments (Searle & Jackson, 2006; Witt & Goodale, 2009). By the ideology of familism, which reifies female's central caregiving roles, was another way in which the ethic of care could be seen to act as a leisure constraint (Hunter & Whitson, 2010; Shaw2011 From another point of view, ethic of care was one of the unique constraints faced by female on their physical recreation participation. In Henderson & Allen, (2004) study, it was proposed that, because of the ethic of care, female often provided for the needs of others first, thus neglecting their own leisure needs. Moreover, many female still did not feel entitled to leisure participation (Henderson et al., 2010). At the same time, females were sometimes reluctant to plan to participate in physical activities because they believed they did not deserve the time for themselves (Henderson, 2006). In another word, the time constraints faced by female can be viewed as their identification on their role in the family, which made them find no time for participation.

It is presumed that those highly educated people should understand the benefit of physical recreation and because of the social back ground; they should encounter fewer constraints in participation. However, the findings indicated that among all the participation groups, the higher educated respondents did not experience lesser constraints.

The studies of leisure constraints provided an effective framework for understanding reasons for non-participation. Likewise, the concept of constraint negotiation might be a helpful model by which to understand efforts that might eventually lead to participation for people who originally felt constrained. Constraint negotiation emerged as a re-consideration on the negative relationship between perceived constraints and activity participation.

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THE RELATIONSHIP BETWEEN SELECTED MOTOR FITNESS, PHYSIOLOGICAL, ANTHROPOMETRIC PARAMETERS WITH PLAYING ABILITY OF SOFTBALL PLAYERS

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INTRODUCTION

Sports are no longer just sports and games. They are business all over the world. The boom in prize money and the practice of internationally renowned sportsman signing on the dotted line to endorse the products has made sports, big business. Sports lovers all over the world are happy that reputed sportsmen are no longer obliged to follow a regime of high thinking and low living.

ANTHROPOMETRIC MEASUREMENTS

Anthropometric measurements have been a part of physical education research and evaluation since its inception. The earlier research was in the area of anthropometry was with the emphasis on changes in muscle size, brought about through exercises (Clarke and Clarke, 1989). Physical educators have long realized that the performance of men and women is greatly influenced by such factors of age, height, arm length, leg length and body structure.

IMPORTANCE OF ANTHROPOMETRIC VARIABLES

Sports scientists and physiologists have been of the opinion those anthropometric measurements and physical components of an athlete have a lot to do with his performance.

Structure of body is one of the related variables of human motor performance. Science of anthropometry has developed primarily in the play fields of physical anthropologists. Scientific anthropometry began with Johann Friedrich Blumenbach who laid the foundation of craniotomy.

OBJECTIVES OF THE STUDY

The aim of the study was to assess the motor fitness, physiological and anthropometrical parameters associated with playing ability of softball players. In doing so the researcher would:

1. Assess the selected anthropometric parameters, such as, height, weight, arm length, leg length and trunk length of softball players.
2. Assess the playing ability of the softball players.
3. Assess the associations of anthropometrical parameters with playing and all the selected variables with playing ability of softball players.

STATEMENT OF THE PROBLEM:

The purpose of the study was to find out, "**The relationship between selected anthropometric parameters with playing ability of softball players**".

LIMITATIONS

1. The factors like diet, daily routine habits would be affecting the results of the study, has not been taken into consideration, hence, treated as a limitation to this study.

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2. The training facilities, the infrastructure and equipment the softball players would have used are bound to differ and these aspects has not been included in the purview of the study, which is considered as a limitation to this study.
3. The type of training that the players undertook in various geographic conditions etceteras would be affecting the playing ability of the players, which is not included in the purview of this research, which is considered as a limitation to this study.

DELIMITATIONS

1. The study was limited to 50 softball players who participated in All India Softball Ranking Tournament in 'under 15' category.
2. The age of the subjects was between 14 to 15 years.
3. The study was delimited to the following anthropometrical variables.

Anthropometrics Variables
Height,
Weight,
Arm length,
Leg Length and
Trunk Length.

The playing ability of the subjects were subjectively tested through three experts in playing situation and objectively.

METHODOLOGY

The selection of subjects, selection of variables, pilot study, collection of data, the orientation procedures, collection of data, tools used, and statistical procedure have been presented.The purpose of the study was to find out relationship between selected anthropometric parameters with playing ability of softball players

SELECTION OF SUBJECTS

To achieve the purpose of the study, the investigator selected fifty softball players, who participated in All India Softball Ranking Tournament in "under 15" category during the year 2013-14. The subjects were in the age group of 14 to 15 years.

All the subjects had participated in the inter-school, inter-district, inter-zonal and state level competitions and represented their states in the All India Tournaments, and they were in "under 15" category, hence they were considered as softball players for the purpose of this study.

SELECTION OF VARIABLES

The researcher reviewed number of Books, Journals, Research Articles, Coaching Manuals and found that playing ability of a softball player may have relationship with selected anthropometric variables. Based on these observations, the investigator selected the following variables for this study

Independent Variables:-Anthropometric Variables

1. Height
2. Weight
3. Arm Length
4. Leg Length
5. Trunk Length

Dependant Variable

Playing ability in Softball subjectively measured by three experts. .

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RESEARCH DESIGN:-A repeated measure research design was used with playing ability in softball as the criterion variable and selected Anthropometric variables were considered as the independent variables. The methodology adapted in this study is given.

COMPUTATION OF RELATIONSHIP ON ANTHROPOMETRIC PARAMETERS WITH PLAYING ABILITY

Descriptive Analysis

The relationship of anthropometric parameters with playing ability of softball players was statistically computed. In descriptive statistics the number of subjects tested, mean and standard deviation of the physiological parameters are presented in Table-I.

Showing Descriptive Statistics on Anthropometric Parameters Selected for this study

Variables	Mean	Std Deviation	N
Height	169.62	7.29	50
Weight	50.96	5.10	50
Arm Length	75.42	4.65	50
Leg Length	101.66	4.01	50
Trunk Length	68.24	4.13	50

Table-I shows the obtained mean value on height was 169.62 with standard deviation + 7.29. The mean value on Weight was 50.96 with standard deviation + 5.10. The mean value on Arm Length was 75.42 with standard deviation + 4.65. The mean value on Leg Length was 101.66 with standard deviation + 4.01. The mean value of Trunk length was 68.24 with standard deviation + 4.13.

Analysis of Coefficient of Correlation

The obtained values were subjected to statistical treatment to find out the association of each anthropometric parameter with the playing ability of the subjects. The results are presented in Table-II.

Showing Correlation of Coefficient between Physiological Parameters and Playing Ability of the subjects

S.No.	Variables Playing Ability Vs.	Correlation Coefficient	Level of Sig.
1	Height	0.397	<0.05
2	Weight	0.380	<0.05
3	Arm Length	0.449	<0.05
4	Leg Length	0.266	NS
5	Trunk Length	0.422	<0.05

Required table r value $(1,49)_{0.05}$ = 0.273

The results presented in Table-II proved that there was a significant relationship between playing ability and height (r: 0.397), playing ability and weight (r: 0.380), playing ability and arm length (r: 0.449). Playing ability and trunk length (r: 0.422) as the obtained 'r' values were greater than the required 'r' value of 0.273 to be significant at 0.05 level.

The relationship between playing ability and leg length (r: 0.266), was not significant as the obtained 'r' value was lesser than the required table of 0.273 value to be significant at 0.05 level.

Analysis of Multiple Regression

Having found the relationship between playing ability with anthropometric parameters selected for the study, to find out the association of all selected anthropometric variables with playing ability and to find out

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which are all the anthropometric variables contributes for playing ability. The obtained data were subjected to statistical analysis using multiple regression analysis. The results are presented in Table-III.

Table-III: Showing ANOVA for Variables Height, Weight, Arm Length, Leg Length and Trunk Length

Variance	Sum of Squares	df	Mean Square	F	Sig.
Regression	245.347	1	245.347	12.158*	0.001
Residual	968.658	48	20.180		
Total	**1214.005**	**49**			

A. Predictors: (Constant), Arm Length

It is clear from the Table-III that the obtained F-value of 12.158 was significant at 0.001 level, which was much higher than the required level of 0.05. It revealed that the anthropometric variable, arm length was found to be significantly associated with the playing ability of the softball players significantly as determined by the regression analysis, as obtained F-ratio was significant.

The stepwise multiple regression between selected anthropometric variables and softball playing ability of softball players are presented in table-IV.

Stepwise Multiple Regression between Anthropometric Variables and Softball Playing Ability of Softball Players

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
5	0.449	0.202	0.185	4.492

A Predictors: (Constant), Arm Strength

Table-III reveals that among the anthropometric variables arm strength is very much influencing the playing ability of softball players as the obtained 'R' value 0.449, was greater than the required 'R'. From 'R' square value, it is clear that 20% of playing ability of softball players is mainly due to arm length of the players.

The variables in the equation are given in Table-V.

Variables in the Equation of Softball Players

Variables	B	SE B	Beta	't'	Level of Sig.
(Constant)	42.254	10.435		4.049	0.000
Arm Length	0.482	0.138	0.450	3.487	0.001

Multiple Regression Equation

Playing ability of Softball Players on Anthropometric Variables

= 42.254 +0.482 (Arm Length)

The independent variables, which were not in the equation, are given in Table-VI.

Table-VI: Anthropometric Variables Not in the Equation of Elite Softball Players

Variables	Beta in	't'	Significance
Height	-0.018	-0.070	0.944
Weight	0.179	0.847	0.401
Leg Length	0.016	0.061	0.952
Trunk Length	-0.361	-1.563	0.125

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A Predictors in the Model: (Constant), Arm Length

B Dependent Variable: Playing Ability

Table-VI shows the excluded variables from the equation, as these variables were found to be lesser than the required significance of 0.05 level fixed for this study. Thus, the excluded variables from the equation are anthropometric variable height, weight, leg length and trunk length.

DISCUSSION ON FINDINGS

Relationship of Anthropometric Variables with Playing Ability

To find out the relationship of anthropometric variables and playing ability of softball players, the investigator selected five anthropometric variables, namely, height, weight, arm length, leg length and trunk length.

The simple correlation coefficient between each of the selected anthropometric variables with the playing ability proved that height, weight, arm length, trunk length were significantly related to playing ability as the obtained 'r' value was greater than the required table 'r' value to be significant at 0.05 level. There was no significant relationship between leg length and playing ability of the players.

In this present study to find out the association between selected anthropometric variables with playing ability, the multiple regression analysis excluded weight, trunk length, height, and leg length with obtained 't' values of -0.070, 0.847, 0.061, and 1.563 respectively, which are less than the required 't' values to be significant at 0.05 level. Thus, the anthropometric variable, arm length was found to be significantly associated with playing ability with obtained 't' value 3.487 as this 't' value was greater than the required table value to be significant at 0.05 level. And the variable was included in the equation with the multiple correlation.

DISCUSSIONS ON HYPOTHESES

The selected anthropometric variables, such as, height, weight, arm length, leg length and trunk length would have significant relationship with the playing ability of the softball players.

The softball playing ability could be successfully predicted with selected motor fitness, physiological and anthropometric parameters.

The formulated hypothesis No. 3 stated that the selected anthropometric variables, such as, height, weight, arm length, leg length and trunk length would have significant relationship with the playing ability of the softball players. The simple correlation coefficient between playing ability and selected anthropometric variables, height, weight, arm length and trunk length were significant at 0.05 as the obtained 'r' values were greater than the required 'r' value to be significant. Hence, the formulated hypothesis No. 3 was accepted at 0.05 level. However, there was no significant relationship between playing ability and leg length of the subjects and the hypothesis was rejected for leg length.

The formulated hypothesis No. 4 stated that the softball playing ability could be successfully predicted with selected motor fitness, physiological and anthropometric parameters. The obtained data were further subjected to statistical analysis using step-wise multiple regression to determine the multiple correlation. The regression analysis proved that motor fitness variables, abdominal strength, speed, reaction time and cardiovascular endurance were significantly associated and the following equation can be drawn for the playing ability of softball players:

Playing ability of Softball Players = 135.856 – 4.628 (Speed) – 0.011 (Cardiovascular Endurance) –1.158 (Reaction Time) –0.417 (Abdominal Strength).

The obtained data on physiological variables were subjected to statistical analysis using backward multiple regression to determine the multiple correlation. The regression analysis proved that physiological variable, respiratory rate was significantly associated with playing ability and the following equation can be drawn to determine the association between playing ability and physiological variables selected for this study.

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Playing ability of Softball Players on Physiological Variables
= 93.829 -0.595 (Respiratory Rate)

The obtained data on anthropometric variables were subjected to statistical analysis using backward multiple regression to determine the multiple correlation. The regression analysis proved that anthropometric variable, arm length was significantly associated with playing ability and the following equation can be drawn to determine the association between playing ability and anthropometric variables.Playing Ability = 46.411 +0.434 (Arm Length)Thus, the formulated hypothesis No. 4 that softball playing ability could be successfully predicted with selected motor fitness, physiological and anthropometric parameters is accepted at 0.05 level.

CONCLUSIONS

It was concluded that anthropometric variables, height, weight, arm length, and trunk length were significantly related with playing ability of softball players.It was concluded that anthropometric variable, leg length was not significantly related with softball players.

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EFFECT OF PLAY AND MOMENT EDUCATION APPROACH ON SELECTED PHYSICAL FITNESS VARIABLE OF ELEMENTARY SCHOOL CHILDREN

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INTRODUCTION

Physical exercises have been considered as an essential part of human life. The survival of man is physical and movement or the activity is the foremost important thing one learns soon after birth. The literate meaning of 'physical' is 'body' which strictly relates to physique, health, strength, endurance, speed, agility, flexibility, and physical performance on the sports ground (Uppal, 2000).

PHYSICAL ACTIVITY FOR ELEMENTARY SCHOOL CHILDREN

Young children are physically active in different ways than older children, adolescents, or adults. Because most physical activity in young children is equivalent to gross motor play, the researcher suggest that the term "play," not the terms "physical activity," "exercise," or "sports," be used to promote movement in young children. As pre-schoolers play, they have brief bouts of varied activities with frequent rest periods. Compared with exercising adults, children at play have more spontaneity and less interest in sustaining a single activity. These differences may result from differing needs of the developing brain to provide itself, through activity, with a pattern of varied stimulation from the environment that subserves its own optimal development.

PLAY AND MOVEMENT APPROACH

A major challenge in resurrecting free play is how best to reach parents with messages about the important role of play in their children's lives. Although those who are providing primary health care to children have a crowded agenda and little time for behavioural counselling, communicating with parents about play. Nevertheless, receive high consideration because the benefits of play can be presented in a way that is congruent with parents' aspirations for their children's well-being. The Special Supplemental Nutrition Program for Women, Infants, and Children also has an enormous potential to provide the same messages to parents about play. The Women, Infants and Children Program serves more than 7.5 million U.S. women and children, and almost half of all U.S. children are enrolled in Women, Infants, and Children programme at some point in their lives. With the growing problem of obesity in children enrolled in Women, Infants, and Children programme, new behavioural messages are required to promote energy expenditure. But these messages also need to be formulated with the language and set of outcomes that parents will find most meaningful (Jain, A., Sherman, S.N., Chamberlin, D.L., Carter, Y., Powers, S.W. and Whitaker, R.C. 2001).

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the "effect of play and movement approach on selected physical fitness variables (**Cardio respiratory Endurance**)of elementary school children."

LIMITATION

The study was limited in the following aspects:

1. Regular activities pertaining to the elementary school children's day-to-day affairs were not controlled.

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2. The factors such as climate, study hours and motivation of the subjects were not taken into consideration.
3. The subjects' diet and nutrition were not taken into consideration.
4. The parental influence and support towards participation in the study were not considered.
5. The growth and maturity factors were not controlled, and
6. The influence of academic work on the performance variables and training could not be controlled.

1.12 DELIMITATIONS

The study was delimited as below:

1. This study was delimited to the elementary school students in the age group of 9 to 10 years.
2. The subjects were randomly selected and a total of 80 children and 20 children were randomly assigned to each group.
3. The training was given for a period of 16 weeks.
4. The play and movement approach training were given for three days a week.

Only selected physical fitness components (**cardiovascular endurance**) were assessed

Cardio respiratory Endurance

According to Basco and Williams (1983) endurance is "the capacity to sustain movement or effort over a period of time.

Cardio-respiratory endurance is operationally defined as an amount of time taken to complete 600 yards at a shortest possible time and was measured to the nearest one tenth of a second.

METHODOLOGY

The researcher explained the methodology adopted on play and movement education approach. Such as, the subjects selected for this study, the research design, the criterion variables selected for this study, the experimental variables (play and movement education approach), reliability of the tests testers reliability, pilot study, collection of data and statistical approaches made in analysing the collected data.

SELECTION OF SUBJECTS

The purpose of the study was to find out the effect of play and movement education approach on selected physical fitness variable of elementary school children.

To achieve the purpose of the study, eighty elementary school children were selected from different schools of Guntur District, Andhra Pradesh. The selected subject age group was ranging from nine to ten, studying in fourth and fifth standard in different schools. The subjects were randomly divided into four groups and each group consists of twenty subjects. Group one acted as experimental group-I, Group two acted as experimental group-II, group three acted as experimental group-III and group four acted as control group.

SELECTION OF VARIABLES

Dependent Variables- Physical Fitness Components-: Cardio-respiratory Endurance

Independent Variables

1. Play activities for twelve weeks
2. Movement activities for twelve weeks
3. Play and movement activities for twelve weeks.

EXPERIMENTAL DESIGN

For the purpose of the study, random group design was employed. Randomly selected (N=80) elementary school children in the age group of 9 to 10 were assigned into four groups consisting of 20 each. The groups were considered as experimental group-I, experimental group-II, experimental group-III and control group. Prior to the experimental treatment, all the subjects were measured of the criterion variables selected for this study, such as, cardiovascular endurance,. The collected data formed initial scores. Experimental Group

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one underwent selected plays activities for twelve weeks. Experimental Group two underwent selected movement activities for twelve weeks. Experimental Group three underwent selected play and movement activities for twelve weeks. The control group did not participate in any experimental treatment except of their regular. Immediately after completion of the experimental period, the subjects were tested of their physical fitness variables, which formed final scores. The difference between initial and final scores was considered as the effect of respective experimental treatment. To test statistical significance, the data collected were tested for the differences, which were considered as the effect of play and movement education on elementary school children through Analysis of Co-variance (ANCOVA). In all cases 0.05 level was fixed.

Results on Cardiovascular Endurance

The descriptive statistics comparing the initial and final means of physical fitness Cardiovascular Endurance due to play activities, movement activities, combined play and movement activities and control groups of elementary school children is presented in Table I.

Table I; Descriptive Statistics on Play Activities, Movement Activities, Combined Activities and Control Group

Groups	Test	Mean	Standard Deviation	RANGE	
				Min.	Max.
Play Activities	Initial	478.82	39.69	412.40	552.80
	Final	480.49	45.86	415.80	561.60
	Adjusted Mean	473.49			
Movement Activities	Initial	486.27	62.82	405.00	604.80
	Final	446.58	51.44	372.60	534.60
	Adjusted Mean	432.99			
Combined Activities	Initial	452.52	27.34	388.80	502.20
	Final	410.40	27.25	361.80	464.40
	Adjusted Mean	426.67			
Control Group	Initial	466.02	37.82	399.60	545.40
	Final	462.78	35.78	399.60	545.40
	Adjusted Mean	467.10			

Table I shows that pre-test mean on Cardiovascular Endurance of play activities group was 478.82 with standard deviation ±39.69 pre-test mean of movement activities training group was 486.27 with standard deviation ±62.82. The pre-test mean of combined groups consisting of play activities and movement activities training was 452.52 with standard deviation ±27.34, the pre-test mean of control group was 466.02 with standard deviation ±37.82.

The descriptive statistics on post-test mean on Cardiovascular Endurance of play activities group was 480.49 with standard deviation ±45.86 post-test mean of movement activities training group was 446.58 with standard deviation ±51.44. The post-test mean of combined groups consisting of play activities and isometric training group was 410.40 with standard deviation ±51.44, the post-test mean of control group was 462.78 with standard deviation ±35.78.

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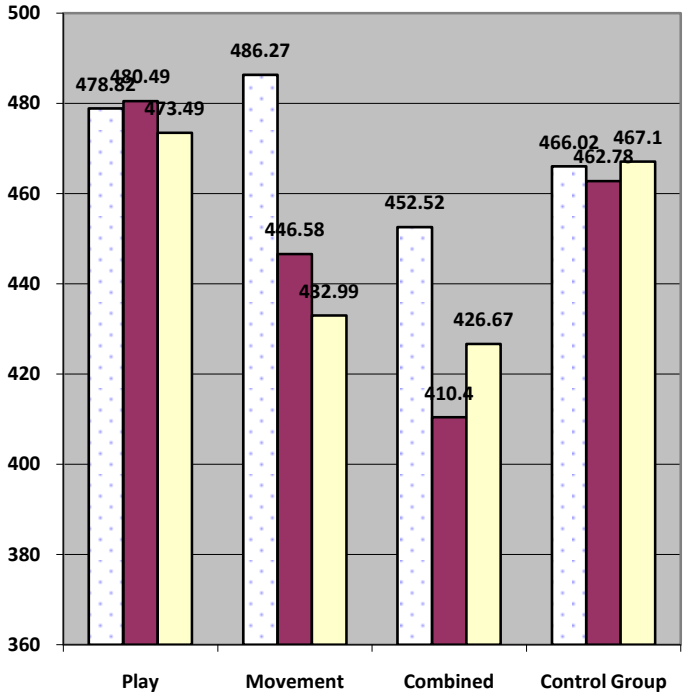
The adjusted mean on Cardiovascular Endurance on play activities group was 473.49, movement activities training group was 432.99, combined training group was 426.67 and control group was 467.10, as shown in Table I.

The obtained mean values on the experimental and control groups were presented in Figure-IV.

Figure-I: BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED MEANS ON CARDIOVASCULAR ENDURANCE



The results on descriptive statistics proved that physical fitness variable Cardiovascular Endurance were improved. And to test statistical significance of the differences, the obtained data on Cardiovascular Endurance using ANCOVA was presented in Table II.

Table II: COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO PLAY PRACTICE, MOVEMENT ACTIVITIES AND COMBINED TRAINING ON CARDIOVASCULAR ENDURANCE

	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-test Mean	Between	13212.04	3	4404.01	2.29
	Within	146282.60	76	1924.77	
Post-test Mean	Between	53458.62	3	17819.54	10.52*
	Within	128681.68	76	1693.18	
Adjusted Post-test Mean	Between	33381.15	3	11127.05	58.80*
	Within	14193.44	75	189.25	

Required $F_{(0.05),\,(df\ 3,75)}$ =2.77

* Significant at 0.05 level of confidence

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As shown in Table II, obtained F-ratio of 2.29 on pre-test means of the groups was not significant at 0.05 level, as the obtained F-value was less than the required table F-value of 2.77 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage.

The results presented in Table II, the obtained F-ratio of 10.52 on post-test means of the groups was significant at 0.05 level as the obtained F-value was greater than the required table F-value of 2.77 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at initial stage.

Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done. The obtained F-value on adjusted means was 58.80. The obtained F-value was greater than the required value of 2.77 and hence, it was accepted that there were significant differences among the adjusted means on the Cardiovascular Endurance of the subjects.

Since significant improvements were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table III.

Table III: Multiple Comparisons between Play Practice, Movement activities, Combined and Control Groups and Scheffe's Post-hoc Analysis on Cardiovascular Endurance

Play activities Group	**Movement activities Group**	**Combined Group**	**Control Group**	**Mean Diff.**	**C.I.**
473.49	432.99			40.50*	12.43
473.49		426.67		46.83*	12.43
473.49			467.10	6.39	12.43
	432.99	426.67		6.32	12.43
	432.99		467.10	34.11*	12.43
		426.67	467.10	40.44*	12.43

***** Significant at 0.05 level.

The post-hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 12.43. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Play activities Group *Vs.* Movement activities Training Group (MD: 40.50)

Play activities Group *Vs*. Combined Training Group (MD: 46.83)

Movement activities Group *Vs.* Control Group (MD: 34.11)

Combined Group *Vs.* Control Group (MD: 40.44)

The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.

Play activities Group *Vs.* Control Group (MD: 6.39)

Movement activities Group *Vs.* Combined Training Group (MD: 6.32)

DISCUSSIONS ON RESULTS AND HYPOTHESIS

Experiences with outdoor play equipment stimulate movement exploration and creative play. There is a large body of scientific literature that demonstrates the health-promoting effects in adults of various forms of physical activities. However, little attention has been paid to those influences in early life that allow children to enter adulthood with the abilities to develop and to maintain their overall fitness. These abilities arise through early influences on the developing brain that can be cultivated through unstructured free play and movement activates. In this study, the investigator was interested to make out a study on the effect of play and movement

education approach on selected physical fitness variables. Such as, cardiovascular endurance, of elementary school children, the results of which were presented in Tables I to III.

The results presented in Table I proved that there were improvements from initial and final scores on cardiovascular endurance among the experimental groups play activities, movement activities and combined play and movement activities. The improvements were found to be significant at 0.05 level, as the obtained F-value of 58.80 was greater than required table value of 2.77. The paired mean comparisons presented in Table III proved that all the three experimental groups significantly improved cardiovascular endurance compared to control group and the combined play and movement activities group was significantly better than isolated play activities group.

The formulated hypothesis No. 1 that there would be significant differences due to play, movement and play and movement approaches on selected physical fitness variables of elementary school children comparing to control group was accepted at 0.05 level.

CONCLUSIONS

It was concluded that physical fitness variable, such as, cardiovascular endurance was significantly improved due to play activities, movement activities and play and movement activities compared to control group. And it was found that combined play and movement activities were found to be significantly better than isolated plays activities and movement activities group.

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A SYSTEMATIC REVIEW INTO THE EFFICACY OF STATIC STRETCHING AS PART OF A WARM-UP FOR THE PREVENTION OF EXERCISE-RELATED INJURY

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ABSTRACT

A systematic review of the literature was undertaken to assess the efficacy of static stretching as part of the warm-up for the prevention of exercise related injuries. Computer-aided literature search for articles post-1990 and pre-January 2013 related to static stretching and injury prevention using MEDLINE, SPORT Discus, PubMed, and Science Direct databases. All relevant randomized clinical trials (RCTs) and controlled clinical trials (CCTs) satisfying inclusion/exclusion criteria were evaluated by methodological assessment to score the studies using accredited criteria. Seven out of 364 studies met the inclusion/exclusion criteria. All four RCTs concluded that static stretching was ineffective in reducing the incidence of exercise-related injury, and only one of the three CCTs concluded that static stretching did reduce the incidence of exercise-related injury. Three out of the seven studies noted significant reductions in musculotendinous and ligament injuries following a static stretching protocol despite non significant reductions in the all-injury risk. All RCTs scored over 50 points (maximum possible score = 100), whereas all CCTs scored under 45 points. There is moderate to strong evidence that routine application of static stretching does not reduce overall injury rates. There is preliminary evidence, however, that static stretching may reduce musculotendinous injuries.

Keywords: review, static stretching, injury prevention, sport

INTRODUCTION

The relationship between stretching and injury prevention has been substantially researched, and several systematic reviews have been conducted, with the general census showing stretching to have no positive effect on preventing injury (Herbert and Gabriel 2002; Shrier 1999;Thacker et al. 2004; Weldon and Hill 2003). These studies, however, have focused largely on general stretching, which has consequently included a variety of different techniques and interventions including static, dynamic, proprioceptive neuromuscular facilitation (PNF), and ballistic stretching. It is difficult, therefore, to identify specifically which type of stretching actually may aid injury prevention without isolating and reviewing the individual techniques separately. Hence, it is the aim of this review to examine the literature specifically concerning static stretching and its effects on injury prevention when compared with either no stretching at all or an unaltered stretching/ warm-up routine.

METHOD

A computer-aided literature search was performed using MEDLINE, SPORT Discus, Pub Med, and Science Direct databases, selected as they all contain large amounts of relevant literature in the areas of sport and physical activity. The electronic databases were searched using a number of key terms as selected by the authors: stretching, static, injury, prevention, and exercise. In relation to study type, a further set of key terms were selected in order to retrieve relevant study designs to later meet inclusion criteria: randomized, controlled, trial, clinical, double, single, and blind. Searches were performed by systematically combining the key terms to

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enable a maximum amount of exposure for potentially relevant studies (using Boolean operators 'OR' and 'AND').

Topic Search

1 STRETCHING (medical subjects heading term, all subject headings and in text)
2 STATIC (all subject headings and in text)
3 STATIC AND STRETCHING (medical subjects heading term, all subject headings and in text)
4 INJURY AND PREVENTION (in text)
5 STRETCHING OR STATIC AND INJURY AND PREVENTION (in text)
6 SPORT OR EXERCISE AND STRETCHING
7 SPORT OR EXERCISE AND INJURY AND PREVENTION

Publication Type Search

8 RANDOMISED AND CONTROLLED AND TRIAL (in publication type)
9 CONTROLLED AND CLINICAL AND TRIAL (in publication type)
10 RANDOMISED AND CONTROLLED AND TRIAL (in text)
11 CONTROLLED AND CLINICAL AND TRIAL (in text)
12 DOUBLE AND BLIND AND METHOD OR SINGLE AND BLIND AND METHOD (medical subjects heading term and all subject headings) In addition to this search, further examination of references from the retrieved studies was performed and any key journals identified were hand searched for any relevant studies not previously recovered by other methods. The methodological design of the review included a set of criteria that had to be adhered to in order to select only relevant studies: (1) The studies should preferably be RCTs, as they are seen as the gold standard by which the benefits of therapy are judged (Greenhalgh 1997). As RCTs are relatively scarce in this field, however, CCTs also were reviewed, with all studies retrieved investigating static stretching as an injury prevention measure (additional interventions were to be allowed as long as a control group also was present). Both RCTs and CCTs were defined using definitions determined by the Cochrane Guide for Systematic Reviews by Van Tulder et al. (2003), with RCTs defined as a trial in which individuals are assigned prospectively to one of two or more intervention programmes using some quasirandom method of allocation, and CCTs defined as a trial in which individuals are assigned prospectively to one of two or more intervention programmes using a random allocation method. (2) Participants ideally should be professional or amateur sportsmen; however, due to the lack of relevant studies using these participants, studies involving subjects engaging in physical activity or exercise also were reviewed. Participants also must be between 18 and 48 years old of either sex, as this population identified should provide an adequate yield of studies whilst also revealing results of benefit to the adult sporting community. Furthermore, younger athletes if included would create additional complications, as various physiological factors involved during their growth phase in life potentially may impair results. There also must be a minimum of 20 participants taking part in each study, as it generally is accepted that any fewer would result in higher confidence intervals and greater P values, therefore increasing the likelihood of misleading results. Furthermore, smaller sample sizes are more likely to increase the difficulty in detecting smaller, potentially clinically important, effects (Batterham and Atkinson 2005). (3) Only studies from 1990 to January 2008 were reviewed; earlier studies, although considered, were excluded from assessment in order to review findings from more recently conducted studies reflecting modern-day static stretching practices. (4) Any abstracts or unpublished studies were excluded. (5) The injury rate must be determined using a standardized "time loss" definition of injury, or a definition expressing to the same effect: a recordable injury is one that causes absence from training or competition participation, from which the study must be conducted over at least a 12-week period.

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RESULTS

A total of 364 studies were retrieved from the literature search: however, only seven matched the inclusion criteria, four of which were RCTs and three of which were CCTs (Table 2). A summary of the process involved in retrieving suitable studies can be viewed in the flowchart presented based on the process developed for the quality of reporting of meta-analyses (Moher et al. 1999; The trials then underwent methodological assessment as previously described, with results ranging in quality from 26 to 79 points out of a possible 100 (Table 3). All four RCTs and two of the three CCTs (those by Bixler and Jones 1992; Cross and Worrell 1999) were deemed to be negative for static stretching. Conclusions were based, however, on the effect of static stretching on total injuries risk and not necessarily the author's own conclusions to make the results more comparable. Findings from both Bixler and Jones (1992) and Cross and Worrell (1999) suggested that static stretching was in fact beneficial in reducing the risk of sprain and strain type injuries; however, their results revealed no significant difference between control and intervention groups for total number of injuries ($P > 0.05$). These studies, therefore, were deemed negative. All four RCTs scored over 50 points, showing a reasonably sound overall methodological quality, whereas all CCTs scored under 50 points, the lowest being 26, and therefore showing less satisfactory methodological quality. Common areas in which the CCTs often performed poorly in terms of methodological quality included subject selection and clear definitions of the inclusion and exclusion criteria and details on specific characteristics of participants (criterion A); sampling methods described (i.e., randomized awarded higher points than convenience samples.

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ASSOCIATION OF SELECTED ANTHROPOCENTRIC VARIABLES WITH PLAYING ABILITY OF BADMINTON PLAYERS

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INTRODUCTION

Sport plays a very prominent role in the modern society. It is important to individual, a group, a nation and indeed the world. Throughout the world, sport has a popular appeal among people of all ages and both sexes. Much of the attraction of sport comes from the wide variety of experience and feeling that result from participation such as success, failure, exhaustion pain, relief and feeling of belonging. Sport can bring money, glory, status and goodwill. However, sport can also bring tragedy, grief and even death.

HISTORY OF BADMINTON

Badminton is a great game that everyone can enjoy, regardless of size or shape. It's great for anaerobic fitness, one's reactions and the explosive power will improve. Badminton was invented long ago; a form of sport played in ancient Greece and Egypt. Badminton came from a child's game called battledore and shuttlecock, in which two players hit a feathered shuttlecock back and forth with tiny rackets. The game was called "POONA" in India during the 18th century, and British Army Officers stationed there took the Indian version back to England in the 1860's. The army men introduced the game to friends, but the new sport was definitely launched there at a party given in 1873 by the Duke of Beaufort at his country place, "Badminton" in Gloucestershire. During that time, the game had no name, but it was referred to as "The Game of Badminton," and thereupon, Badminton became its official name (Guillain, Jean-Yves, 2004).

Badminton Today

Badminton is a game that somewhat resembles tennis and volleyball and involves the use of a net, lightweight rackets, and a shuttlecock, a cork ball fitted with stabilizing feathers. Two or four players play it, either indoors or outdoors, on a marked-out area 44 ft (13.41 m) long by 17 ft (5.18 m) wide for the two-player game and 20 ft (6.10 m) wide for the four-player game. A net is fixed across the middle of the court, with the top edge of the net set to a height of 5 ft (1.52 m) from the ground at the center and 5 ft 1 in (1.55 m) at the posts. The players hit the shuttlecock back and forth over the net with the rackets (Guillain, Jean-Yves, 2004).

ANTHROPOMETRY

"The human body is a machine of wondrous complexity capable of strong and violent movements. This machine is made up of slightly more than two hundred bones to which are attached better than six hundred muscles" (Eston, R. and Reilly, T. 2008).

There are numerous factors, which are influencing performance of sportsman of the physical including shape, size, weight and height. Each and every nation wants to show their supremacy in any sports and games. The Olympic motto itself shows "Faster, higher and stronger". The challenges inspire all nations to exhibit greater performance in sports through application of research in modern science any technology.

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ANTHROPOMETRIC MEASUREMENTS

Anthropometric measurements have been a part of physical education research and evaluation since its inception. The earlier research was in the area of anthropometry was with the emphasis on changes in muscle size, brought about through exercises (Clarke and Clarke, 1987). Physical educators have long realized that the performance of men and women is greatly influenced by such factors of age, height, arm length, leg length and body structure.

The sculpture of Greece and Rome preserve the ideas of those civilizations concerning the idea proportions of the human figure. It is interesting to see in their sculpture the swing of the pendulum of approval from athlete who where broad shouldered, thick set square chested and very muscular, to athletes who are leaner, more supple, and whose figure are more representative of the skills of the finer coordination. Since the early times there has been continued use of anthropometric measurement to determine its relationship with performance in different games and sports.

IMPORTANCE OF ANTHROPOMETRIC VARIABLES

Sports scientists and physiologists have been of the opinion those anthropometric measurements and physical components of an athlete have a lot to do with his performance.

Structure of body is one of the related variables of human motor performance. Science of anthropometry has developed primarily in the play fields of physical anthropologists. Scientific anthropometry began with Johann Friedrich Blumenbach who laid the foundation of craniotomy.

Anthropometric measurements are dimensions of structure of human body taken at specific sites to give measures of length, girth and width. The results can be used to appraise body build, nutritional status and posture. Certain anthropometric consideration somato-type features and racial traits are identified as advantageous for performance in top sports. An individual for superior performance in any sports is selected based on physical structure of body size he possesses (Carter, 1982).

These specific measurements of limb length, circumference, breadth, build indices can reveal the relationship between the anthropometry of the athlete and his motor fitness. Measurement of body size included such descriptive inscription as height, weight, and surface area while measures of body proportion describe the relationship between height, weight and arm length, width and circumference of various body segments. It has been found that top athletes in some sports tend to have those proportions that bio mechanically aid the particular performance required (Carter, 1982).

OBJECTIVES OF THE STUDY

1. Assess the selected anthropometric parameters, such as, height, weight, arm length, leg length and trunk length of badminton players.
2. Assess the playing ability of the badminton players.
3. Assess the associations of selected anthropometrical parameters with playing and all the selected anthropometric variables with playing ability of badminton players.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out “the association between selected anthropometric variables such as, height, weight, arm length, leg length and trunk length with playing ability of badminton players”.

LIMITATIONS

1. The factors like diet, daily routine habits would be affecting the results of the study, has not been taken into consideration, hence, treated as a limitation to this study.
2. The training facilities, the infrastructure and equipment the badminton players would have used are bound to differ and these aspects has not been included in the purview of the study, which is considered as a limitation to this study.

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3. The type of training that the players undertook in various geographic conditions etcetera would be affecting the playing ability of the players, which is not included in the purview of this research, which is considered as a limitation to this study.

DELIMITATIONS

1. The study was limited to 100 badminton players who participated in All India Badminton Ranking Tournament in 'under 15' category.

2. The age of the subjects was between 14 to 15 years.

3. The study was delimited to the following anthropometrical variables.

4. The playing ability of the subjects were subjectively tested through three experts in playing situation and objectively tested through four specific skill tests in badminton.

METHODOLOGY

The selection of subjects, selection of variables, pilot study, collection of data, the orientation procedures, collection of data, tools used, and statistical procedure have been presented.

The purpose of the study was to find out relationship between selected motor fitness, physiological, anthropometric parameters with playing ability of softball players

SELECTION OF SUBJECTS

To achieve the purpose of the study, the investigator selected hundred badminton players, who participated in All India Badminton Ranking Tournament in "under 15" category during the year 2014- 15. The subjects were in the age group of 14 to 15 years.

All the subjects had participated in the inter-school, inter-district, inter-zonal and state level competitions and represented their states in the All India Tournaments, and they were in "under 15" category, hence they were considered as badminton players for the purpose of this study.

SELECTION OF VARIABLES

The researcher reviewed number of books, journals, research articles, coaching manuals and found that playing ability of a badminton player may have association with selected anthropometric variables. Based on these observations, the investigator selected the following variables .

Anthropometrics Variables

Height,
Weight,
Arm length,
Leg Length, and
Trunk Length.

Dependent Variable

Playing ability in Badminton subjectively measured by three experts.

RESEARCH DESIGN

A repeated measure research design was used with playing ability in badminton as the criterion variable and selected anthropometric variables were considered as the independent variables. The selected variables were measured from 100 Badminton players. Obtained data were collected using standard tests. The data collected were statistically analyzed using Pearson's Correlation Coefficient to find out the association between each variable with dependent variable, playing ability. The association of selected anthropometrical variables were found out through Multiple regression equation. In all cases 0.05 level was fixed to test the hypothesis of this study.

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RESULTS AND DISCUSSIONS

COMPUTATIONOF RELATIONSHIPON ANTHROPOMETRIC PARAMETERS WITH PLAYING ABILITY

Descriptive Analysis

The association of anthropometric parameters with playing ability of badminton players was statistically computed. In descriptive statistics, the number of subjects tested, mean and standard deviation of the physiological parameters are presented in **Table-I.**

Showing Descriptive Statistics on Anthropometric Parameters Selected for this study

Variables	Mean	Std. Deviation	N
Height	170.49	6.27	100
Weight	51.43	4.70	100
Arm Length	75.82	4.60	100
Leg Length	101.99	3.75	100
Trunk Length	68.92	3.34	100

Table-I shows the obtained mean value on height was 170.49 with standard deviation ±6.27. The mean value on Weight was 51.43 with standard deviation ± 4.70. The mean value on Arm Length was 75.82 with standard deviation ±4.60. The mean value on Leg Length was 101.99 with standard deviation ±3.75. The mean value of Trunk length was 68.92 with standard deviation ±3.34.

Analysis of Coefficient of Correlation

The obtained values were subjected to statistical treatment to find out the association of each anthropometric parameter with the playing ability of the subjects. The results are presented in **Table-II.**

Showing Correlation of Coefficient between Anthropometric Variables and Playing Ability of the subjects

S.No.	Variables Playing Ability Vs	Correlation Coefficient	Level of Sig.
1	Height	0.514	<0.05
2	Weight	0.508	<0.05
3	Arm Length	0.507	<0.05
4	Leg Length	0.269	<0.05
5	Trunk Length	0.632	<0.05

Required table r value $(1,99)_{0.05}$ = 0.197

* Significant at 0.05 level.

The results presented in Table-II proved that there was a significant association between playing ability and height (r: 0.513), playing ability and weight (r: 0.508), playing ability and arm length (r: 0.505). Playing ability and trunk length (r: 0.269) as the obtained 'r' values were greater than the required 'r' value of 0.197 to be significant at 0.05 level.

Analysis of Multiple Regression

Having found the association between playing ability with anthropometric parameters selected for the study, to find out which are all the anthropometric variables contributes most for playing ability, the obtained data were subjected to statistical analysis using multiple regression analysis. The results are presented in **Table-III.** Showing ANOVA for Variables Height, Weight, Arm Length, Leg Length and Trunk Length

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Variance	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	924.39	1	924.39	65.37*	0.00
Residual	1385.80	98	14.14		
Total	**2310.188**	**99**			

A. Predictors: (Constant), Trunk Length

* Significant at 0.05 level

It is clear from the table-III that the obtained F-value of 65.37 was significant at 0.00 level, which was much higher than the required level of 0.05. It revealed that the anthropometric variable, trunk length was found to be significantly associated with the playing ability of the badminton players significantly as determined by the regression analysis, as obtained F-ratio was significant. The stepwise multiple regression between selected anthropometric variables and badminton playing ability of badminton players are presented in Table-IV.

STEPWISE MULTIPLE REGRESSION BETWEEN ANTHROPOMETRIC VARIABLES AND BADMINTON PLAYING ABILITY OF BADMINTON PLAYERS

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
5	0.400	0.394	3.760	0.400

A Predictors: (Constant), Trunk Length

Table-IV reveals that among the anthropometric variable trunk length is very much influencing the playing ability of badminton players as the obtained R-value 0.400, was greater than the required R. From R-Square value it is clear that 39 per cent of playing ability of badminton players was mainly due to trunk length of the players.

The variables in the equation are given in **Table-V.**

VARIABLES IN THE EQUATION OF BADMINTON PLAYERS

Variables	**B**	**SE B**	**Beta**	**'t'**	**Level of Sig.**
(Constant)	14.985	7.818		1.917	0.058
Trunk Length	0.916	0.113	0.633	8.085	0.000

Multiple Regression Equation

Playing ability of Badminton Players on Anthropometric Variables

= 14.985 +0.916 (Trunk Length)

The independent variables, which were not in the equation, are given in **Table VI.**

Anthropometric Variables Not in the Equation of Elite Badminton Players

Variables	**Beta In**	**'T'**	**Significance**
Weight	-0.125	-0.822	0.413
Height	-0.127	-0.819	0.415
Arm Length	-0.016	-0.119	0.906
Leg Length	-0.052	-0.573	0.568

A Predictors in the Model: (Constant), Trunk Length

B Dependent Variable: Playing Ability

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Table-VI shows the excluded variables from the equation, as these variables were found to be lesser than the required significance of 0.05 level fixed for this study. Thus, the excluded variables from the equation are anthropometric variable weight, height, arm length and leg length.

DISCUSSIONS ON FINDINGS

Relationship of Anthropometric Variables with Playing Ability

To find out the association of anthropometric variables and playing ability of badminton players, the investigator selected five anthropometric variables, namely, height, weight, arm length, leg length and trunk length.

The simple correlation coefficient between each of the selected anthropometric variables with the playing ability proved that height, weight, arm length, leg length and trunk length were significantly related to playing ability as the obtained 'r' value was greater than the required table 'r' value to be significant at 0.05 level.

In this present study to find out the association between selected anthropometric variables with playing ability, the multiple regression analysis excluded weight, height, arm length. Leg length with obtained 't' values of -0.822, -0.819, *0.119, and -0.573 respectively, which were less than the required 't' values to be significant at 0.05 level. Thus, the anthropometric variable, trunk length was found to be significantly associated with playing ability as the obtained 't' value was greater than the required table value to be significant at 0.05 level. And the variable was included in the equation with the multiple correlation.

DISCUSSIONS ON HYPOTHESIS

The selected anthropometric variables, such as, height, weight, arm length, leg length and trunk length would have significant association with the playing ability of the badminton players. The badminton playing ability could be successfully predicted with selected anthropometric parameters. The formulated hypothesis No. 3 stated that the selected anthropometric variables, such as, height, weight, arm length, leg length and trunk length would have significant association with the playing ability of the badminton players. The simple correlation coefficient between playing ability and selected anthropometric variables, height, weight, arm length, leg length and trunk length were significant at 0.05 as the obtained 'r' values were greater than the required 'r' value to be significant. Hence, the formulated hypothesis No. 3 was accepted at 0.05 level.

The obtained data on anthropometric variables were subjected to statistical analysis using backward multiple regression to determine the multiple correlation. The regression analysis proved that anthropometric variable, arm length was significantly associated with playing ability and the following equation can be drawn to determine the association between playing ability and anthropometric variables.

Playing ability of Badminton Players on Anthropometric Variables= 14.985 +0.916 (Trunk Length)

Thus, the formulated hypothesis No. 4 that badminton playing ability could be successfully predicted with selected anthropometric parameters is accepted at 0.05 level.

CONCLUSIONS

It was concluded that anthropometric variables, height, weight, arm length, leg length and trunk length was significantly associated with playing ability of badminton players.

It was concluded that the multiple regression analysis found significant association between anthropometric variables with playing ability of elite badminton players and the equation obtained was:

Playing ability of Badminton Players on Anthropometric Variables= 14.985 +0.916 (Trunk Length)

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EFFECT OF CONTINUOUS RUNNING, FARTLEK AND INTERVAL TRAINING ON SELECTED MOTOR ABILITIE, VARIABLES OF MALE FOOTBALL PLAYERS

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ABSTRACT
The purpose of the study was to find out the effect of Continuous running, Fartlek and Interval training on selected motor abilities, variables of male football players.The investigator has selected sixty inter collegiate football men players at random, their age ranged from 18-25 years. The subjects chosen for the study were divided into four equal groups and designated as experimental group 'A' experimental group 'B' experimental group 'C' and control group 'D'. Continuous running were given to group 'A' Fartlek training group 'B' Interval training given to group 'C' and the control group 'D' were restricted to participate in any activities. The trainings were given for a period of twelve weeks. The data were collected before and after the training. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. Where ever the 'F' ratio was found significant scheffe's post test was used for find out the significant differences among the paired mean. The results of the study showed that continuous running, fartlek training and interval training are significantly improved than control group.

Keywords: Continuous running, Fartlektraining, Interval training, Flixibulity, Agility.

INTRODUCTION

Continuous training as the name implies, involves continuous activity, without rest intervals. This has varied from high intensity, Continuous activity of moderate duration to low-intensity activity of an extended duration, i.e. long, slow distance, or 'LSD" training. LSD training is probably the most widely used from of endurance conditioning for jogger who want to stay in condition for health-related purpose, the athlete who participate in team sports and endurance-trains for general condition, and the athlete who wants to maintain his endurance condition during the off-season. ***Ajmer Singh et al., (2003)***

Fartlek training is running with carious intensity according to requirement of the athlete and dictates of the terrain. The athlete will use a terrain which undulates and makes varying demands upon him. (Ex. Hills, Woodland, Ploughed land, sand) like the alternating pace method, anaerobic period provides a sting stimulus for the improvement of VO_2 maximum. In addition, the demands of terrain stimulate strength endurance development and proprioceptive balance adjustment of ankle, knee and hip. ***(Dick 1980)***

Interval training is a form of progressive conditioning in which the intensity of the activity, the duration of each bout. The Number of bouts, the time or kind of resting period between bouts, on the order of the bouts is varied **Baby (1927).** According to **Mathews and Fox (1974),** Interval training as work or exercise followed by the property of prescribed relief interval.

Motor Ability

General abilities it has been traditional for motor behavior to be divided into categories. In the light of more recent research some doubt now exists concerning the generality of movement. Some scientists believe

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that all movement is highly specific to the task and there can be no such things as general ability or capacity. The issue has not been settled clearly; however, so for purpose of this text the traditional general qualities of motor capacity, motor educability, motor ability and motor fitness will be present traditionally motor ability has been viewed as a combination of factors that are basic to all movement. Motor ability is a result of innate capacity and diverse training and experience. It further implies that a valid measure of it must avoid highly specialized skills as revealed in dance or sports (**Barrow 1957).**

Henry and Roger (1960) Some Scientist and theoreticians believe that there is no such quality as general motor ability and that all abilities are specific to the task. An inevitable controversy exists between the traditionalist, who believes that some abilities are general in nature and the researcher, who views all abilities as highly specific. It is theorized that performance from one skill to another is independent provided that these skill patterns are unrelated. The skill is specific group headed by Henry and Slater-Hummel goes so far to deny that there can be any transfer between skills. In Henry's so called memory drum theory an action pattern, once learned, is stored in the nervous system much as program in a computer for recall. Only specific skill pattern can store, and they are recalled much as in digital computer. Motor ability means person ability to learn a general trait or capacity of a person relatively enduring character tics and serves as determinants of a person achievement potential for the performance of specific skill. Whereas motor ability that is specifically related to the performance of a motor skill. Each person has variety of motor ability. Motor abilities establish achievement potentials for specific motor skill and motor skill requires specific motor abilities to successfully performance. Many specific abilities have been identified and grouped. Examples include: multi-limb coordination, control precision, aiming, explosive strength, dynamic flexibility, speed of limb movement, movement rate, and force control.

Mathews (1973) emphasis the Motor fitness as limited phases of that the motor ability. The major components of motor ability namely Endurance, Power, Strength, Agility, Flexibility, Balance and Coordination. And also emphasizes that the fundamental or gross big muscle movements that are dominated by muscular energy, kinesthetic sense and suppleness of the major tissues and joints. The capacity for efficient performance is the basic requirements of running, jumping, dodging, falling, climbing, swimming, lifting, weight, carrying loads and enduring under sustained effort in a variety of situations. Quick and efficient control of the body in an emergency may save the life of one individual or of many.

Flexibility,:-Flexibility is defined as the ability to perform movement with greater range of motion or large amplitude **(Uppal A.K. 2001).**Flexibility refers to the absolute range of movement in a joint or series of joints that is attainable in a momentary effort with the help of a partner or a piece of equipment. Flexibility in some joints can be increase to as certain degree by stretching **(Hardyal Singh 991).**

Agility :-Agility is generally defined as the ability to change direction quickly and effectively while moving as possible at full speed. **(Singer 1975).**Agility is the ability to move and change direction and po0sition of body quickly and effectively while under controlled **(Ajmer Singh 2007).**

Statement of the problem:-The purpose of the study was to find out the effect of Continuous running, Fartlek and Interval training on selected motor abilities,(**Agility Flexibility,)** variables of male football players.

METHODOLOGY:-The purpose of the study was to find out the Effect of Continuous running, Fartlek and Interval training on selected Physiological variable(Agility Flexibility,) of male football players.. To achieve the purpose of this study sixty inter collegiate football men players were selected at random from in and around the Guntur district Andhra Pradesh. Their age ranged from 18 to 25 years. The subjects chosen for study was divided into four groups and designated as experimental group A, experimental group B, experimental group C and control group D. Each groups consisted of fifteen players. Continuous running was given to group A, Fartlek training given to group B, Interval training given to group C and control group C was restricted to participate in any of the

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training programme other than their regular activities. Training was given three days in a week for twelve weeks. The subject were tested on at the Agility& Flexibility,, beginning (Pre-test) and at the end of the experimental period (Post-test). To measure the, Agility& Flexibility, Semo Agility Test& Sit And Reach Test, respectively because of their simplicity and availability of necessary facilities, instrument and equipment's.

SEMO Agility Test (Kansal 1996)

Purpose:-The purpose of the test was to find out the agility

Equipment's:-A stop watch, four plastic cones 9"X9" base having 12" height and a basketball court or any smooth area measuring 12"X 19".

Test Administration:-After a demonstration given by a trained helper, the tester asks the subject to stand just outside the marked rectangle at the starting point (S). With his back towards the free throw line, the subject waits for the signal ready, steady, Go. At the word Go the tester starts the stop watch while the subject starts side stepping to his/her fastest speed until he reaches outer corner of the second cone from where the subject starts back paddling (running backward) from the outer corner of the second cone to the inner corner of the cone number 3, from where he comes out of the rectangle and takes forward running sprint from cone 3 to cone 1 just outside the 19" marked line. As soon as the subject reaches the cone no. 1 he is to take a side turn and again run back pedaling to reach the inner corner of the cone no.4 at the free throw line where he has to change the direction to perform another sprint from the outer corner of the test rectangle at cone no 4 to cone no 2 Where he is to perform a side step to his/her left to reach the finish line as rapidly as possible with his/her best effort. As soon as he steps outside the finish line with his/her both feet, the tester stops the stop watch.

Scoring:-Each subject is given two trails and time of each trail is noted accurate up to 0.1 second. The lesser value of the time out of the two trails is the score of the subject.

SIT AND REACH TEST (in centimeters)

Purpose:-The Purpose of the test was to measure the flexibility (extensibility) of the low back and posterior thighs.

Equipment:-Standard Sit and Reach box was used.

Description:-The student sits down at the test apparatus with knees fully extended and the feet slightly apart. The feet are flat against the front board. The arms are extended forward with the hands placed on top of each other. The student reaches directly forward, palms down, along the measuring scale for four times and holds the position of maximum reach on the fourth trial. This position is held for one second. **Johnson and Nelson (1988)**

Scoring:-The most distant point reached, to the nearest centimeter is recorded.

RESULT AND DISCUSSION

The analysis of data on **Agility& Flexibility** has been examine by ANCOVA for variables separately in order to determine the differences if any among the group at pre and post test when the differences was found to be significant by ANCOVA, the Scheffe's post hoc test was applied to assess the significant differences between the adjusted mean.

Table- I; Analysis of Covariance of data on agility between pre and post test of Continuous running group, Fartlek training group, Interval training group and control group

	CRG	FTG	ITG	CG	Sources of variance	Sum of square	df	Mean Square	'F' ratio
Pre -test									
Mean	13.97	14.00	13.98	14.03	B	0.032	3	0.011	0.066
SD	.385	0.401	0.401	0.409	W	8.923	56	0.160	

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Post- test Mean SD	13.86 0.393	13.87 0.387	13.80 0.396	14.11 0.428	B W	0.837 9.03	3 56	0.279 0.161	1.73
Adjusted post-test Mean	13.89	13.86	13.82	14.08	B W	0.604 0.057	3 55	0.201 0.001	195.35*

**Significant at 0.05 level of confidence*

(The table value required for significant at 0.05 level with df 3 and 56 & 3 and 55 are 2.77 and 2.77 respectively)

The table I Shows that the pre test mean values on agility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups (CG) were 13.97, 14.00, 13.98 and 14.03 respectively. The obtained 'F' value of 0.066 for pre test scores on agility, which was lesser than the table value of 2.77 for significance with df 3 and 56 at 0.05 level of confidence.

The post test mean values on agility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups were 13.86, 13.87, 13.80 and 14.11 respectively. The obtained 'F' value of 1.73 for post test scores on agility, which was lesser than the table value of 2.77 for significance with df 3 and 56 at 0.05 level of confidence.

The adjusted post test mean values on agility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups (CG) were 13.89, 13.86, 13.82 and 14.08 respectively. The obtained 'F' value of 195.35 for adjusted post test scores on agility, which was higher than the table value of 2.77 for significance with df 3 and 55 at 0.05 level of confidence.

The result of the study showed that there was significant difference among Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control group (CG) on agility.

Since four groups were involved the Scheffe's post hoc test was applied to find out the paired mean differences if any, and it is presented in **Table II**

Scheffe's post hoc test for the differences between paired adjusted post test means of agility

CRG	FTG	ITG	CG	MD	CI
13.89	13.86	-	-	0.03*	0.03
13.89	-	13.82	-	0.07*	
13.89	-	-	14.08	0.19*	
-	13.86	13.82	-	0.04*	
-	13.86	-	14.08	0.22*	
-	-	13.82	14.08	0.26*	

***Significant at 0.05 level of confidence**

The table II Shows that the adjusted post test mean differences of Continuous running group (CTG) and Fartlek training group (FTG), Continuous running group (CTG) and Interval training group (ITG), Continuous running (CRG) and Control group (CG), Fartlek training group (FTG) and Interval training group (ITG), Fartlek training group (FTG) and Control group (CG) and Interval training group (ITG) and control group (CG). were 0.03, 0.07, 0.19, 0.04, 0.22 and 0.26 respectively. They were greater than the confidence interval value 0.03 at 0.05 level, which indicate that there is a significant differences among the group of Continuous running group (CTG) and Fartlek training group (FTG), Continuous running group (CTG) and Interval training group (ITG), Continuous training (CTG) and Control group (CG), Fartlek training group (FTG) and Interval training group (ITG), Fartlek training group (FTG) and Control group (CG) and Interval training group (ITG) and control group (CG).

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The Comparison of pre, post and adjusted post mean values of agility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control group (CG) on agility are graphically presented in figure I.

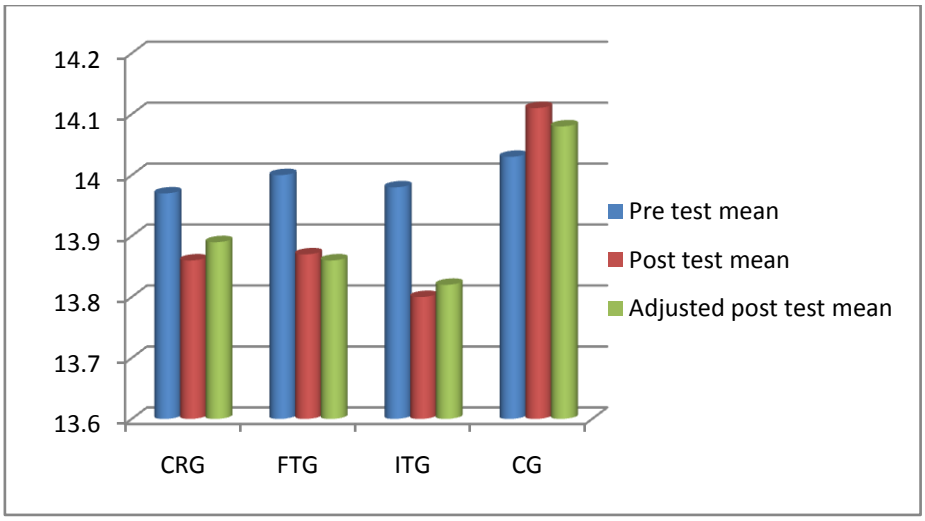

Figure I: Bar diagram showing the pre, post and adjusted post test mean values of Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control group (CG) on agility.

Table- III: Analysis of Covariance of data on flexibility between pre and post test of Continuous running group, Fartlek training group, Interval training group and control group

	CRG	FTG	ITG	CG	Sources of variance	Sum of square	df	Mean Square	'F' ratio
Pre -test Mean	20.00	20.33	20.27	20.27	B	0.983	3	0.328	0.046
SD	2.33	2.49	3.03	2.76	W	399.20	56	7.129	
Post- test Mean	24.07	24.07	24.67	19.47	B	282.00	3	94.00	13.94*
SD	2.43	2.23	3.03	2.61	W	377.60	56	6.743	
Adjusted post-test Mean	24.26	24.49	24.62	19.42	B	286.63	3	95.54	140.12*
					W	37.50	55	0.682	

**Significant at 0.05 level of confidence*

(The table value required for significant at 0.05 level with df 3 and 56 & 3 and 55 are 2.77 and 2.77 respectively)

The table III Shows that the pre test mean values on flexibility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups (CG) were 20.00, 20.33, 20.27 and 20.27 respectively. The obtained 'F' value of 0.046 for pre test scores on flexibility, which was lesser than the table value of 2.77 for significance with df 3 and 56 at 0.05 level of confidence.

The post test mean values on flexibility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups (CG) were 24.07, 24.07, 24.67 and 19.47 respectively. The

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obtained 'F' value of 13.94 for post test scores on flexibility, which was higher than the table value of 2.77 for significance with df 3 and 56 at 0.05 level of confidence.

The adjusted post test mean values on flexibility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control groups (CG) were 24.26, 24.49, 24.62 and 19.42 respectively. The obtained 'F' value of 140.12 for adjusted post test scores on flexibility, which was higher than the table value of 2.77 for significance with df 3 and 55 at 0.05 level of confidence.

The result of the study showed that there was significant difference among Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control group (CG) on flexibility.

Since four groups were involved the Scheffe's post hoc test was applied to find out the paired mean differences if any, and it is presented in table IV

Table- IV: Scheffe's post hoc test for the differences between paired adjusted post test means of flexibility

CRG	FTG	ITG	CG	MD	CI
24.26	24.49	-	-	0.23	0.87
24.26	-	24.62	-	0.36	
24.26	-	-	19.42	4.84*	
-	24.49	24.62	-	0.13	
-	24.49	-	19.42	5.07*	
-	-	24.62	19.42	5.20*	

***Significant at 0.05 level of confidence**

The table IV Shows that the adjusted post test mean differences of Continuous running group (CRG) and control group (CG), Fartlek training group (FTG) and Control group (CG), Fartlek training group (FTG) and Interval training group (ITG) and Control group (CG) were 4.84, 5.07 and 5.20 respectively. They were greater than the confidence interval value 0.87 at 0.05 level, which indicate that there is a significant differences among the group of Continuous running group (CRG) and control group (CG), Fartlek training group (FTG) and Control group (CG) and Interval training group (ITG) and Control group (CG).

The adjusted mean difference of Continuous running group (CRG) and fartlek training group (FTG), Continuous running group (CRG) and Interval training group (ITG) and Fartlek training group (FTG) and Interval training group (ITG) were 0.23, 0.36 and 0.13 respectively. Hence it shows that they were lesser than the confidence interval value 0.87 at 0.05 levels, which indicate that there is no significant differences exist among the group of Continuous running group (CRG) and fartlek training group (FTG), Continuous running group (CRG) and Interval training group (ITG) and Fartlek running group (FTG) and Interval training group (ITG).

The Comparison of pre, post and adjusted post mean values of flexibility for Continuous running group (CRG), Fartlek training group (FTG), Interval training group (ITG) and control group (CG) on flexibility are graphically presented in figure 2.

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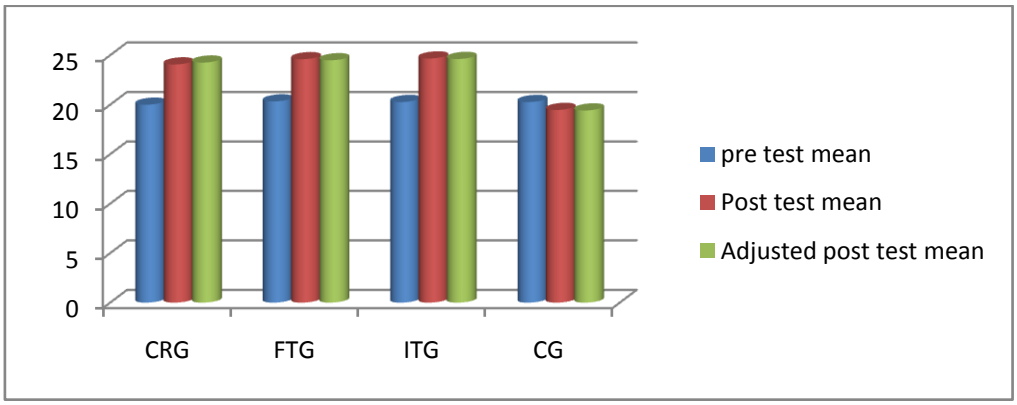

Figure 2: Bar diagram showing the pre, post and adjusted post test mean values of Continuous running group(CRG), Fartlek training group (FTG), Interval running group (ITG) and control group (CG)on flexibility.

DISCUSSING ON FINDINGS

Agility:-The result of the present study observed that agility had improved after the twelve weeks of training programme when compared with control group. The finding of the study is in agreement with the following studies **Manohar (2011)** Continuous Circuit training showed significant improvement in agility. **Raj Kumar (2013)** found that plyometric training program improve agility for collegiate soccer players. **Vijaya lakshmi and Jayabal (2013)** combination of own body resistance exercise and plyometric with and without yogic practices result showed remarkable improvement in the agility.

Flexibility:-The study shows that the effect of continuous fartlek and Interval training significantly increase the flexibility level when compared with control group. The result of the study is in consonance with the following studies namely **Fatourous (2001)** found that aerobic training strength training and combination significantly increase range of motion. **Segal et al., (2004)** reveal that Pilates training improves flexibility. **Srivastava et al., (2013)** suggested that Pilates exercise and callisthenic exercise increase flexibility

Discussion on hypotheses:-In the hypothesis it was stated that there would be significant improvement on selected motor ability variables due to the effect of Continuous training, Fartlek training and Interval training. The result of the study shows that due to the effect of Continuous training, Fartlek is training and Interval training on selected motor ability variables such as flexibility, agility, has significantly improved. Hence the research hypothesis was accepted and null hypothesis was rejected in these case.

Conclusions

1. Agility was significantly improved by the Continuous running group, Fartlek training group and Interval training group when compared with control group.
2. Agility was significantly improved byInterval training group when compared with Continuous running group and Fartlek training group.
3. Agility was significantly improved by Fartlek training group when compare with Continuous running group.
4. Flexibility was significantly improved by the Continuous running group, Fartlek training group and Interval running group when compared with control group.
5. There is no significant improvement in flexibility between Continuous running group, Fartlek training group and Interval training group.

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A STUDY ON INFLUENCE OF FASTING ON HOMOSEPIENS HEALTH

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INTRODUCTION

Fasting is a period of abstinence from all food or specific items. Fluids are consumed in sufficient quantity to satisfy thirst and physiologic requirements. During the absence of food, the body will systematically cleanse itself of everything except vital tissue. Starvation will occur only when the body is forced to use vital tissue to survive. Although protein is being used by the body during the fast, a person fasting even 40 days on water will not suffer a deficiency of protein, vitamins, minerals or fatty acids. In the breakdown of unhealthy cells, all essential substances are used and conserved in a most extraordinary manner. There is an unwarranted fear of fasting that strength diminishes from the catabolism of proteins from muscle fibers. Even during long fasts, the number of muscle fibres remains the same. Although the healthy cells may be reduced in size and strength for a time, they remain perfectly sound.

A. J. Carlson, Professor of Physiology, University of Chicago, states that a healthy, well-nourished man can live from 50 to 75 days without food, provided he is not exposed to harsh elements or emotional stress. Human fat is valued at 3,500 calories per pound. Each extra pound of fat will supply enough calories for one day of hard physical labor. Ten pounds of fat are equal to 35,000 calories! Most of us have sufficient reserves, capable of sustaining us for many weeks.

Rest is understood to be a big factor in enhancing recovery, as it is when the body is at rest that it is able to direct the most energy towards the various chemical and mechanical processes of detoxification. When fasting, a person experiences recovery at a rate that is swifter than normal. He is ridding his body of toxins and excesses; allowing the body to use its own wisdom to healthfully reorganize itself from the atomic level. As the toxic load is reduced, the functioning of every cell is enhanced. In the same way that vital nerve energy is accumulated during a night's sleep, the faster builds nerve energy through rest, sleep, and detoxification.
While fasting, the body is highly conservative of its energy and resources. During this deep and profound rest, toxin intake and production are reduced to a minimum while autolysins and elimination proceed unchecked. Anabolic processes such as tissue and bone healing also proceed at a maximal rate during the fast.

In the body, the first stage of cleansing removes large quantities of waste matter and digestive residues. The first few days of a fast can be rough due to the quantity of waste passing into the blood stream. The tongue becomes coated and the breath foul as the body excretes waste through every opening. After the third day of the fast, there is little desire for food. The second stage is the cleansing of mucous, fat, diseased and dying cells, and the more easily removed toxins. As the fast continues, the cleansing process becomes more thorough. The last stage is the cleansing of toxins that have been accumulating in your cellular tissue from birth, and the microscopic tubes that carry vital elements to the brain. Cleansing of the last layer is only possible through a combination of juice fasting, water fasting, and a healthy diet high in raw foods. To overcome a severe disease

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like cancer, it is important to continue through a series of fasts, to the point where the full scouring action of catabolism removes the disease from the tissue.

BENEFITS OF FASTING

Mental clarity is improved and brain fog is lifted.

Rapid, safe weight loss is achieved without flabbiness

The nervous system is balanced

Energy level and sensory perception is increased. The longer the fast, the bigger increase in energy and Vitality. You normally need less sleep.

Organs are revitalized

Cellular biochemistry is harmonized

The skin becomes silky, soft, and sensitive

There is greater ease of movement

Breathing becomes fuller, freer and deeper

The digestive system is rejuvenated and becomes more effective; the peristaltic action of the intestines (the cause of a natural bowel movement) is stronger after fasting.

Fasting retrains your tasting sense back to more healthy food as acute sensitivity is restored.

Fasting can increase confidence in our ability to have control over our lives and our appetite, and that our body is self-regulating and a self-healing organism capable or establishing balances when given the possibility to do so.

WATER FAST

You can fast from 1 to 40 days. Try to drink 2 liters of water or more per day. The ten day water fast has become a recommended number of days. Ten days on water will cause the same weight loss as 30 days on juice. But water fasting is far more difficult, especially if you have a fast metabolism. Water fasting cleanses the body aggressively removing toxins rapidly. Water fasting can be more beneficial than juice fasting in combating more persistent forms of cancer, cleansing the tissues more aggressively. Water fasting demands mental preparation, the less pressure and responsibility you have during a water fast the better. Think of it a holiday away form the normal patterns of living. Some recommend that the week before your fast, you drink fresh juices and eat mostly raw fruits and vegetables to cleanse the body so that the detoxification during water fasting will be less aggressive. Water fasting should always include two of three days of juice fasting before and after the water fast. This alternating between juice and water fasting is the most effective method of achieving a full cleansing through fasting.

JUICE FAST

Juice fasting is safe and can allow the body to clean itself of toxins while greatly improving conditions for health. A benefit is that your energy level is high because you are receiving sufficient nutrients from the juices, so you can carry out normal activities. A juice fast takes some burden off the digestive system and frees up some energy for accelerated healing though a water fast does much better in that regard. Also, juices can make available extra quantities of nutrients that a person might lack. Juices are easy to assimilate and take hardly any digestive energy from the body, allowing the body to put more energy into healing and rejuvenation. Packed with vitamins, minerals, living enzymes, antioxidants, phytochemicals, yet low enough in calories to force the body to cannibalize on its filthy waste, propelling you to vigorous physical health and clarity of mind.

Most people can juice fast safely for up to 30 days. The exceptions are those with hypoglycemia, diabetes, hypo thyroid, and Wilson's Syndrome. For these conditions, eat slices of avocado and banana every few hours, add high quality vegetable source protein powder to your juices, and add psyllium or another good

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bulking agent to your juices twice a day to regulate blood sugar levels. Do not juice fast if you have impaired kidney function.

Proteins & Fasting

It was theorized that protein loss during fasting was harmful and that a fast should be supplemented with protein. Fasting with protein became known as the Opti-fast. Fasters took nothing but water and a protein drink. Sadly, several people died. Protein digestion during the fasting state created an overload of urea and the blood become acidic. In this condition, the organs become more damaged instead of healing. To the body, fasting is a natural process. During water or juice fasting, the protein levels of the blood remain constant. Although protein is being utilized, a person fasting 40 days on water will not suffer a deficiency of protein, vitamins, minerals or fatty acids.

You may hear rarely of anyone being diagnosed with protein deficiency. Fruit and vegetable juices have water-soluble highly absorbable proteins. The body has a store of protein, and it uses it selectively.

EXERCISE WHILE FASTING

The issue of how much activity is called for on a fast is controversial. Natural Hygienists in the Herbert Shelton tradition insist that all fasters absolutely must have complete bed rest, with no books, no TV, no visitors, no enemas, no exercise, no music, and of course no food, not even a cup of herb tea.

The correct activity level should be arrived at on an individual basis. I have had clients who walked six miles a day during an extended water fast, but they were not feeling very sick when they started the fast, and they were also physically fit. In contrast I have had people on extended fasts who were unable to walk for exercise, or so weak they were unable to even walk to the bathroom, but these people were critically ill when they started fasting, and desperately needed to conserve what little vital force they had for healing.

Most people who are not critically ill need to walk at least 200 yards twice a day, with assistance if necessary, if only to move the lymph through the system. The lymphatic system is a network of ducts and nodes which are distributed throughout the body, with high concentrations of nodes in the neck, chest, arm pits, and groin. Its job is to carry waste products from the extremities to the centre of the body where they can be eliminated. The blood is circulated through the arteries and veins in the body by the contractions of the heart, but the lymphatic system does not have a pump. Lymphatic fluid is moved by the contractions of the muscles, primarily those of the arms and legs. If the faster is too weak to move, massage and assisted movements are essential.

Lymph nodes are also a part of our immune system and produce white blood cells to help control invading organisms. When the lymph is overloaded with waste products the ducts and nodes swell, and until the source of the local irritation is removed, are incapable of handling further debris. If left in this condition for years they become so hard they feel like rocks under the skin. Lumps in the armpits or the groin are prime sites for the future development of a cancer. Fasting, massage, and poultices will often soften overloaded lymph nodes and coax them back into operation.

Fasting will help you to change for the better.

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FITNESS AND WELLNESS THROUGH SPORTS

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INTRODUCTION

The dominance of Jamaicans and Americans of west African and Caribbean descent in world class sporting events as sparked intense debate whether running of specs that drive them to the limits of what is humanly possible is all in the genes.

It is an idea that has been very attractive After all it appears baffling that the tiny island nation of Jamaica with their population of about 2.8 million can consistently produce champion sprinters, while the hole of Asia and Europe can heraldry register more than a handful of athletic in the top eighty two hundred.

Yet sports scientists and geneticists say that attributing sprinting success purely to nature rather than nature is extremely simplistic , and ignores a wealth of cultural and societal factors that of equally important to beating the marc

What is none about genes in sport is that genetic make-up accounts for only 50% of variability in base line performance . This means that sports performance in a contribution of both nature and nurture.

The balance of fast twitch to slow twitch muscles is key for performance. Although training improves muscle performance, slow twitch fibers cannot be converted into fast twitch ,which means that what athletic have is what their genes gave them. It appears that if one does not have at least 70 to 80 fast twitch muscle fibres , it is unlikely that he/she could be among the top sprinters of the world.

There was a flurry of excitement about idea of genes for athletic prowess was evidenced in 2003 when scientists found that a gene called ACTN3 AS CERTEN variants that may give the muscles of champion athletes a performance advantage. However ,what is none is interaction of both nature and nurture that determines the athletic outcome . What is most important is athletic success is that depend mainly on what is provided to the athletic who has the required quality to be a champion . No amount of genetic endowment can ensure outstanding athletic prowess unless adequate and appropriate environment is provided . It is necessary to consider the inputs provided to the athletes to realize the athletics protection . This particular issue is an assertion and integral part of sports development process

SPORTS DEVELOPMENT:

Sports development is “a process whereby effective opportunities, processes, systems where by effective opportunities, processes, systems and structures are set up to enable people in all or particular groups and areas to take part in sport and recreation or to improve their performance to depict sport development opportunities resulted. The base of the pyramid represents mass participation and the top elite participation. The sport development pyramid is not an empirically derived model. It has shaped the thinking, conceptualizing, and planning for sport development in various countries, including Australia. However, as practices have evolved to epitomize more dynamic process than those reflected in the sport development pyramid. The present investigation examined national sporting organization (NSOs) sports development practices and empirically devised three frameworks that illustrate existing sports development procedure, attraction,

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retention/transition and nurturing processes. Therefore, this study overcomes a limitation of the participation pyramid by providing detail about the internal processes and inter-relationship implied within the pyramid metaphor, such a detailed representation of sport development processes adds to our existing knowledge of sport development and in our understanding of how to plan for sport development.

Internationally, some studies have focused on development through sports with an emphasis on the social objectives achieved through physical activity . Others have examined the development of sport and its application to elite athlete development. This lack of [empirically based] theory has also impeded the progress of sport development research (b.c.green,2005,p.234) the frame works resulting from study and be tested in different contexts or on a sport –by-sport basis. Such testing might reveal gaps in the way sporting organizations, pursuer sport development, and assist improve their current pathways and practices, and optimize the use of government funding in sport

Sport development processes

This processes indicate the different stakeholder and the ways they are involved and sport development and the outcomes of their enrollment . The three resulting free works sure they attraction , ration/transition and nurturing process . These three free works to gather show that sport development is more complex and more encompassing .

Sport development *pyramid* focused on the relationship between mass and alit participation (Shilbury at all; 2006; Venkateswarlu, 2010, 1999 ;) Sport development is continuum which as the following four levels:

1. Foundation is the base of the pyramid, and involves the vital first steps of learning basic movement skills.
2. Participation is one level up from the foundation and involves exercising ones leisure option, taking part in sport for health, fitness, friends and fun.
3. Performance is one level higher than participation and involves the challenge of increasing proficiency by striving to improve personal standards of participation
4. Excellence is reaching the top of the pyramid and involves accomplishing nationally and publicly by striving to improve standard performance.

SPORT DEVELOPMENT STRATGIES

The following all this strategies fallowed by stake holder to promote athletic excellence

1. Player development
2. Facilities
3. Coaches, umpires and administration/management
4. Promotions.
5. Competition and events

Sport development processes and pathways

1. The attraction process
2. The retention/transition process
3. The nurturing process

NUTURING SPORT EXPERTISE:FACTORS INFLUENCING THE DEVELOPMENT OF ELITE ATHLETE

1. Training factors
2. Environment factors associated with the attainment of sport expertise
3. Maturational factors
4. Parental influences
5. Cultural factors

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EFFECTS OF DIFFERENT TRAINING PROGRAM PACKAGES ON AGILITY AND EXPLOSIVE POWER PERFORMANCE OF 13-15 YEARS SCHOOL BOYS

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ABSTRACT

The aim of this study was to evaluate the effect of a different degree of contextual interference (CI) training program on the agility and explosive power in students in the 13 to 15 years of school boys. It also evaluated which CI training program was more effective. Eighty eight students (6.42 Â± 0.38 yr) volunteered as participants for the present study. Participants were randomized into 5 different CI training programs (LCI: low contextual interference, MCI: moderate contextual interference, HCI: high contextual interference, VCI: variable contextual interference, and CG: control group) during a 3 week period. Significant Agility improvements ($p < 0.05$) in pre-posttest were found in MCI (4.39%, ES 0.41) and VCI (9.37%, ES 1.12) groups. Furthermore, LCI, MCI and HCI groups ameliorated their explosive power performance. These results suggest that training through games of tag (VCI) was the most effective in improving the Agility and Explosive power training with moderate contextual interference (MCI) was the only type which induced improvements in both capacities.

Key words: CI, AGILITY, EXPLOSIVE POWER, LCI, MCI, HCI, VCI.

The analysis of covariance on leg explosive power of the pre and post test scores of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups have been analyzed and presented in Table I

COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PRE TEST, POST TEST AND ADJUSTED POST TEST ON LEG EXPLOSIVE POWER OF DIFFERENT EXPERIMENTAL AND CONTROL GROUPS

(Scores in centimeters)

Test	Low Intensity	Medium Intensity	High Intensity	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test									
Mean S.D.	2.225	2.225	2.231	2.230	Between Within	0.0009 0.0616	3 116	0.0003 0.0005	0.552
Post Test									
Mean S.D	2.259	2.283	2.325	2.231	Between Within	0.1428 0.1024	3 116	0.0476 0.0009	53.953*
Adjusted Post Test									
Mean	2.262	2.286	2.322	2.229	Between Within	0.1377 0.0409	3 115	0.0459 0.0004	128.917*

*** Significant at .05 level of confidence.**

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(The table values required for significance at .05 level of confidence for 3 and 116 and 3 and 115 are 2.684 and 2.685 respectively)

The table I shows that the pre-test mean values on leg explosive power of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups are 2.225, 2.225, 2.231 and 2.230 respectively. The obtained 'F' ratio of 0.552 for pre-test scores is less than the table value of 2.684 for df 3 and 116 required for significance at .05 level of confidence on leg explosive power. The post-test mean values on leg explosive power of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups are 2.259, 2.283, 2.325 and 2.231 respectively. The obtained "F" ratio of 53.953 for post-test scores is more than the table value of 2.684 for df 3 and 116 required for significance at .05 level of confidence on leg explosive power.

The adjusted post-test means on leg explosive power of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups are 2.262, 2.286, 2.322 and 2.229 respectively. The obtained "F" ratio of 128.917 for adjusted post-test means is greater than the table value of 2.685 for df 3 and 115 required for significance at .05 level of confidence on leg explosive power.

The results of the study indicated that there was a significant difference between the adjusted post-test means of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups on leg explosive power. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table II.

TABLE - II: THE ORDERED SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS ON LEG EXPLOSIVE POWER

(scores in centimeters)

Low Intensity	Medium Intensity	High Intensity	Control Group	Mean Differences	Confidence Interval Value
2.262	2.286	-	-	0.024*	0.014
2.262	-	2.322	-	0.060*	0.014
2.262	-	-	2.229	0.033*	0.014
-	2.286	2.322	-	0.036*	0.014
-	2.286	-	2.229	0.057*	0.014
-	-	2.322	2.229	0.093*	0.014

*** Significant at .05 level of confidence.**

The table II shows that the mean difference value between low intensity plyometric training and medium intensity plyometric training, low intensity plyometric training group and high intensity plyometric training, low intensity plyometric training and control group, medium intensity plyometric training group and high intensity plyometric training, medium intensity plyometric training and control group, high intensity plyometric training and control group are 0.024, 0.060, 0.033, 0.036, 0.057 and 0.093 respectively on leg explosive power which were greater than required confidence interval value 0.014 at .05 level of confidence. Hence, the above comparisons were significant. The adjusted post-test mean values of low intensity plyometric training, medium intensity plyometric training, high intensity plyometric training and control groups on leg explosive power were graphically represented.

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Each participant performed a pre-test and a post-test ses-sion separated by a 3 week period, where the participants were randomly assigned to five different CI training pro-grams (Table 2). At both test sessions the participants performed a SSP test and CODA test. Prior to the pre-test, the researchers gave all participants graphic and direct instructions about how to successfully perform the test. Two test sessions were performed to practice the tests and to ensure that the participants performed both tests correctly.

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EFFECTS OF DIET AND EXERCISE ON QUALITY OF LIFE AND FITNESS PARAMETERS AMONG OVERWEIGHT INDIVIDUALS

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ABSTRACT

Use of very-low-calorie-diets (VLCD) for treatment of Obesity has been adversely related to quality of life (QoL). Because exercise is known to alter mood and self-beliefs in a positive direction, it may offset the negative impact of dieting. The present investigation evaluated the physical and QoL effects of a 12-week VLCD and exercise program. Sedentary obese adults (N = 22) were randomly assigned to either: diet and aerobic training, diet and resistance training, or a wait-list control condition. Data analyses revealed significant increases after 12 weeks in mental health (3% and 7%), QoL (11% and 23%), perceived health (56% and 43%), Peak$V0_2$ (33% and 33%), and significant weight reduction (-19% and -16%) among the aerobic and resistance training groups, respectively, as compared to a control group (< .05). However, resistance and aerobic exercise training were equally effective. Additionally, changes in QoL were unrelated to changes in weight and fitness. Results suggest that individuals who participate in either an aerobic or resistance training program while consuming a VLCD experience a greater QoL than control patients. Importantly, these results indicate that the changes in weight and QoL are similar when using either aerobic or resistance training with a VLCD. The results also support the contention that psychological effects of exercise may be independent of physical change.

Key Terms: AEROBIC, RESISTANCE, BODY FAT, MOOD, BODY WEIGHT

INTRODUCTION

Research has demonstrated that overweight individuals, particularly women, may feel negatively stigmatized. This is commonly thought to contribute to the negative affect and decreased quality of life (QoL) noted among obese persons. Quality of life refers to ones global appraisal of their life factoring in physical, social, and psychological factors. However, research has not generally found significant associations between obesity and psychological distress after pertinent socioeconomic and demographic factors have been adequately controlled. Ross has proposed that, independent of weight, the act of dieting in an attempt to fit social norms heightens unpleasant self-other comparisons and feelings of physical and psychological inadequacy among obese individuals pursuing sustained weight loss. In a large cross-sectional study, Ross demonstrated that rather than the state of being overweight, the act of dieting and the impact of obesity on perceived physical health were both independently responsible for the mental health consequences of obesity.

Very-low-calorie diets (VLCD) are sometimes recommended in cases of extreme obesity. Their use has primarily been limited to persons who have failed to lose weight in more conventional diet programs and whose body mass index (BMI) is greater than 30. The use of exercise in addition to a VLCD may ameliorate potential impairment in QoL among individuals using a VLCD. Moreover, it has been suggested that the beneficial effect of exercise on QoL may be independent of short-term weight loss, and the psychological effects of exercise in improving mood and self-efficacy may serve to promote long-term weight loss.

While the majority of experimental studies exploring the effect of exercise on mental health have utilized aerobic activity as the mode of exercise, debate exists regarding the relative physical and mental health benefits of resistance training, particularly for obese individuals or example, meta-analytic reviews have

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indicated that while aerobic exercise was superior to resistance training in reducing anxiety, resistance or aerobic exercise training produced moderate to large effects on depression with no one mode demonstrating a statistical superiority.

We are aware of no published studies that have compared the physiologic and QoL effects of aerobic and resistance training among obese individuals consuming VLCD. The purpose of the present investigation was to examine the effect of mode of exercise on QoL, weight loss, and fitness among obese participants utilizing a VLCD. We hypothesized that aerobic and resistance training would be equally effective in improving fitness, weight loss, and QoL, and that both exercise conditions would be superior to an information wait-list control condition. A secondary aim of the study was to determine if change in QoL was independent of weight and fitness changes.

METHODS

Participants and Procedures

Sedentary adult men (n = 4) and women (n = 18) between the ages of 21 and 60 years of age (37.0 ± 10.4 years) with a body mass index greater than 30 (34.9 ± 3.1) who were otherwise healthy were recruited through newspaper advertisements to participate in a 12 week diet and exercise study. Eligible participants completed an informed consent and were asked to complete a QOL survey and a fitness assessment consisting of a symptom limited graded exercise treadmill test (GXT) and a body weight analysis.

Following baseline assessments, participants were randomly assigned to one of three conditions: aerobic exercise and VLCD (A-VLCD) (n = 10), resistance training and VLCD (R-VLCD) (n = 8), or a wait-list control (n = 4). All participants were individually monitored at each exercise session to assure compliance with both the resistance and aerobic training protocols. Because our primary objective was to compare exercise modes and to maximize participant compliance and adherence with study procedures, we over sampled for exercise plus diet conditions and offered an exercise and VLCD program to control condition participants following completion of the study. Preliminary analyses indicated that groups were not significantly different at baseline with respect to demographic and outcome variables ($p > .10$). All control group participants reported that they refrained from exercise which was corroborated by non-significant weight and VO_2 changes from baseline to follow-up ($p > .05$)

Diet and Exercise Training Protocols

The VLCD consisted of a liquid formula (40% protein, 49% carbohydrate, 11% fat) ingested five times a day yielding a total of 800 Kcals/day. Two multivitamin tablets were also consumed daily.

Participants were instructed to consume the diet every day for the entire 12 weeks of the study, to drink at least 64 oz of water or other non-caloric beverages, and to refrain from all other food or beverage intake. All subjects met with an investigator, trained in the use of dietary logs, each week and were questioned about their medical condition and their compliance to the dietary protocol. Only one week worth of supplement was given at a time requiring subjects to be present at the weekly weigh-in and meeting sessions. Adherence to the diet was questioned if weight loss was less than two pounds per week. Each subject was asked to give a verbal declaration of adherence to the diet at each weekly meeting. Self reported compliance was excellent. Control subjects were also questioned about their level of activity and asked to give a verbal declaration that they did not participate in any regular form of exercise.

R-VLCD

The diet plus resistance training group performed a circuit-type workout of resistance exercises three days/week at 10 stations (Universal weight machine) inclusive of four lower body and six upper body exercises for 12 weeks. Weight was gradually increased until subjects were lifting 75% of one-repetition-maximum for 2 sets of 12-15 repetitions by the start of week three. Participants increased to three sets by week seven and to

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four sets by week nine. From week nine to 12, sets and repetitions were kept constant while weight was increased. Approximately one minute was allowed between each exercise in the circuit.

A-VLCD

The diet plus aerobic training group exercised four days/week by walking, biking, or stair climbing at 60-80% of maximal heart rate as determined by treadmill GXT. Exercise duration began at 20 min/day and it was increased each week by 10 minutes until subjects were exercising 50-60 minutes at each session. Heart rate was determined by radial artery palpation every 10 minutes.

Measures

QoL

A short form of the Medical outcomes Study Health Status Questionnaire (MOS-30), a widely used measure assessing eleven parameters of physical and psychological functioning, was used to assess participants QoL at study entry and at the end of 12 weeks. In addition to an overall QoL rating, two specific MOS sub-scales (mental health and perceived health change) were pre-selected as outcome measures because of their theoretical importance to the study and to reduce the likelihood of experiment-wise error of multiple comparisons with all eleven subscales.

Body Weight & Body Composition

Weight was measured at baseline and again at 12 weeks. In order to control for diurnal variations, weight was measured the same time of day. Hydrostatic weighing was used to determine percent fat and fat free mass at baseline and at 12 weeks by a previously validated method.

Peak VO_2

Peak oxygen consumption was determined at baseline and at 12 weeks by a symptom limited treadmill GXT using a modified Balke protocol. After reviewing procedures of the GXT subjects were fitted with a noseclip and a Hans Rudolph non-re breathable mouthpiece. Briefly, the protocol was initiated at a comfortable but brisk walking speed (2.5 to 3.5 mph) at zero percent elevation. Treadmill speed remained constant throughout while the elevation was raised one percent each minute until volitional fatigue. Breath by breath oxygen analysis was done with an Aerosport metabolic system. Participants were encouraged to continue until volitional fatigue.

Data Analysis

Due the limited number of men recruited for study entry, gender was collapsed into treatment condition. MOS-30, weight, and Peak VO_2 data were assessed in six 3 x 2 (Group x Time) repeated measures analyses of variance (ANOVA) calculations corrected for unequal sample size. The ANOVAs were calculated to derive appropriate mean-square and mean-square error terms for use in planned non-orthogonal simple effects contrast analyses. Simple effects planned contrasts tested the hypothesized difference between a) both exercise conditions (collapsed) versus the control; and b) the resistance versus aerobic exercise conditions for each outcome variable. Pearson Product moment correlation coefficients were then calculated to determine the relationship between the change in QOL and each of change in weight and Peak VO_2. Significance levels were set at the .05 level (two-tail) for all analyses.

RESULTS

Group means at baseline and at 12 weeks for QOL and fitness parameters are presented in Table 1. As can be seen in Table 1, decreases in body weight and percentage of fat and increases in Peak VO_2 and time to fatigue were observed for both the A-VLCD and for R-VLCD conditions which were significantly different from the control group (= 8.03, 2.38, 2.83, and 3.83, $p < .02$ respectively). However, Peak VO_2, time to fatigue, body weight and percentage of fat were not significantly different between exercise conditions (all $p > .30$). Similarly, significant improvements in QOL, mental health, and perceived health were observed for the A-VLCD and the R-

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VLCD groups in comparison to the control condition = 2.35, 3.04, and 3.93 $p < .05$ respectively), but again, exercise groups were not significantly different from each other, (all $p > .30$).

Pearson Product-Moment correlation coefficients were calculated to determine the degree to which changes in weight and Peak VO_2 were related to changes in quality of life indices. Correlation analyses indicated that changes in weight, percentage of fat, Peak VO_2 , and time to fatigue were not significantly related to changes in perceived physical health (rs = -.34 to .35, respectively), mental health (rs = -.48 and .18, respectively), or overall QOL (rs = -.30 and -.01, respectively) (all ps >.05).

Table 1: Mean ± SD Weight, Peak VO_2, and MOS-30 Values for Diet-Exercise Groups

Measure (n = 22)	Baseline			12-Weeks Post-intervention			Contrast Effect Size
	A-VLCD	R-VLCD	Control	A-VLCD	R- VLCD	Control	r
Weight	93.8±15.1	95.5±17.3	96.1±7	75.5±10.5	80.7±13	98.6±7.2	(1) .90** (2) .22
% Fat	44.5±7	46.6±5.8	40.3±7.6	37.1±6	38.1±4.5	39.2±10.1	(1) .47** (2) .10
VO_{2Peak} (ml/kg/min)	20.6±3	21.1±3.7	19.5±2.4	27.5±3.2	28.0±5.1	21.1±4.1	(1) .56** (2) .05
Time to Fatigue (min)	12.1±3.8	10.6 ±2.7	13.0±1.3	17.5±2.8	14.8±4.0	12.8±1.5	(1) .67** (2) .22
Mental Health	23.5±1.7	21.6±1.9	23.3 ±1.7	24.1±2.0	23.1±1.6	20.8±3.1	(1) .57** (2) .02
Perceived Health	2.7±0.5	2.8±0.5	2.8±0.5	1.2±0.6	1.6±0.9	3.0±0.1	(1) .67** (2) .24
Quality of Life	1.9±0.3	2.6±0.7	2.5±0.7	1.7±0.5	2.0±0.5	2.5±0.6	(1) .47* (2) .05

Groups: aerobic exercise and diet (A-VLCD); resistance training and diet (R-VLCD); wait-list control (control). Effect sizes represent contrasts comparing (1) combined exercise conditions versus control and (2) A-VLCD versus R-VLCD. MOS-30 Scale ranges: Mental Health (0-26); Perceived health (1 = "much better" to 5 = "much worse"); Quality of Life (1 = "very well, could hardly be better" to 5 = "very bad, could hardly be worse"). *p < .05; **p < .01

DISCUSSION

As predicted, combined diet and exercise programs out performed a standard control condition with respect to changes in weight and functional capacity. Moreover, both diet-exercise programs resulted in improved quality of life and mental health as compared to the control condition, but changes in QOL were independent of changes in weight or fitness. Resistance and aerobic training were similarly effective in producing short term improvements in weight, Peak VO_2, and QOL among individuals on a VLCD. Our findings regarding the relative effectiveness of resistance versus aerobic training are consistent with meta-analytic investigations comparing exercise modality effects on mental health and a prior investigation of a long term weight loss study employing a moderately low calorie diet.

Our results indicate that changes in physical parameters, especially weight change, were unrelated to quality of life changes. These results also parallel findings from prior investigations that reported that

depression, anxiety, and general mood disturbance changes following an exercise program can result without an improvement in fitness. Change in self-referent thought, which is well known to underpin change in affective states and capacity for behavioral self-regulation, may occur from exercise. For example, exercise induced changes in confidence, self-perception, and global self-efficacy may be particularly important for overweight individuals attempting to pursue and maintain weight loss. The influence of exercise on self referent though was not examined in our study but may contribute to QOL changes.

The favorable psychological changes associated with a combined diet and exercise program have important treatment implications for individuals considering a VLCD for weight loss. Since exercise is a predictor of long term weight loss, it is important to find an exercise mode that the person enjoys and will continue. Since aerobic exercise and resistance training are equally effective in improving quality of life and weight loss, the exercise prescription should be based on individual preferences. Utilizing different forms of exercise may limit boredom and decreased compliance. The long term effect of resistance exercise on weight loss maintenance is an important topic for future research.

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THE IMPACT OF EXERCISE ON CHOLESTEROL LEVELS - A REVIEW

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ABSTRACT

The link between cholesterol and coronary heart disease (CHD) has been fairly well established through long-term studies of high levels of blood cholesterol and the incidence of CHD. High-density lipoprotein cholesterol (HDL-C) levels are inversely and independently associated with reduced risk of CHD (Neiman 1998). The risk of CHD increases by 2 to 3% for every 1.0 mg/dl decrease in HDL-C (Durstine & Haskell 1994). It is well established that a sedentary lifestyle contributes significantly to the development of CHD and that physical activity plays an important role in decreasing CHD mortality. Exercise training has been associated with increased concentrations of HDL-C, however, the amount of exercise necessary to significantly raise HDL-C levels has not been identified. Research in this area has provided inconsistent results, but has suggested that there may be an exercise threshold that must be met before significant changes in HDL-C are observed. Furthermore, a dose-response relationship between the amount of exercise performed and HDL-C has been suggested (Drygas et al. 2000).

Key words: Cholesterol, HDL-C, LDL-C, Triglycerides, VLDL.

INTRODUCTION

A sedentary life-style is associated with an increased risk for acute myocardial infarction and death from coronary heart disease (CHD) (Kokkinos et al, 1995). It is widely known that CHD is one of the main causes of death in most countries (Buyukyazi, 2008).This risk is approximately twice as high in sedentary persons compared with physically active people (Kokkinos et al, 1995).Physical inactivity is now recognized by the American Heart Association as an independent risk factor, comparable to the other established risk factors for coronary heart disease (Fletcher, Blair &Blumenthal, 1992). Increasing physical activity is strongly recommended to improve the coronary risk profile (Fletcher, Blair & Blumenthal, 1992; The Expert Panel, 1998). It is well established that habitual physical activity improves physical fitness in middle-aged men and women (American College of Sports Medicine, 1986). Low levels of physical activity and cardiorespiratory fitness are both associated with higher risk of all cause and disease specific mortality (Roohi & Niknam, 2008).

Exercises have an effect providing euphoria resulting from the secretion of endogen opioid. Prospective epidemiologic studies have strongly established that sedentary life style has increased the risk of coroner artery illness (Pfaffenbarger, 1993). Serum lipid concentrations are often used to evaluate the risk of CHD. Previous studies have shown that low serum concentrations of high density lipoproteins (HDL) together with high serum concentrations of total cholesterol (TC), triglycerides (TG) and lipoproteins are associated with an increased risk of CHD (Shearman et al,2010).

Cholesterol

Cholesterol is a waxy, fat like substance found in all animal products (i.e., meats, dairy products and eggs). The body can make cholesterol in the liver and it can absorb cholesterol from the diet. Cholesterol is essential to the body and is used to build cell membranes, produce sex hormones, and form bile acids, which are

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necessary for the digestion of fats. It is essential that you have some cholesterol for optimal health; however, when blood levels are too high, some of the excess is deposited in the artery walls, increasing the risk for heart disease.

Lipoproteins

Cholesterol is a fat-soluble substance that is carried in the blood by special transporters called lipoproteins. Lipoproteins are an essential part of the complex transport system that exchanges lipids among the liver, the intestine, and peripheral tissues. The different types of lipoproteins are classified based on the thickness of the protein shell that surrounds the cholesterol. Four main classes of lipoproteins have been categorized: chylomicron, derived from the intestinal absorption of triglycerides; very low density lipoprotein (VLDL), made in the liver for the transport of triglycerides; low-density lipoprotein (LDL), a product of VLDL metabolism and the primary transporters of cholesterol; and high-density lipoprotein (HDL), involved in the reverse transport of cholesterol to the liver (Durstine & Haskell, 1994).

The role of LDL-cholesterol (LDL-C), sometimes called the “bad” or “lousy” cholesterol, is to transport cholesterol to various body cells and deposit excess cholesterol in the artery walls, increasing the risk of heart disease. LDL-C is a VLDL molecule with most of the triglyceride removed and almost all of the cholesterol remaining. A desirable level of LDL-C is below 130 mg/dl, with an optimal level of 100 mg/dl or less.

HDL-cholesterol (HDL-C), sometimes called the “good” or “healthy” cholesterol, is responsible for the transport of cholesterol from the blood and artery walls to the liver where it is converted to bile to be used for digestion or disposed of by the body. This “reverse cholesterol transport process” is believed to be helpful in preventing or reversing heart disease. HDL molecules have two main subclasses: HDL2 and HDL3 (Durstine & Haskell, 1994). The HDL3 molecule is synthesized in the liver and put into circulation to collect cholesterol. As the HDL3 molecule increases its cholesterol content, it becomes less dense and is classified as HDL2. HDL2 is then recycled in the liver and HDL3 is again released into circulation (Durstine & Haskell, 1994). When HDL-C levels are above 60 mg/dl the risk of heart disease is decreased. It is considered undesirable for HDL-C levels decrease below 35 mg/dl. Table 1 provides a cholesterol classification.

Exercise Intensity Threshold - Men

Data from exercise training studies and epidemiological studies support the existence of an exercise intensity threshold for increases in HDL-C levels. Although exercise studies specifically designed to define such a threshold have not been conducted, many studies give a general idea of the intensity threshold observed to favorably increase HDL-C levels. Several studies have suggested that the threshold for positive changes in HDL-C is an exercise intensity of 6 METs or more (21 ml/kg.min) (Leclerc 1985, Lakka & Salomen 1992). Leclerc and others (1985) also reported that there were no further improvements in HDL-C levels when exercise intensity increased above 6 METs. Stein et al. (1990) reported significant increases in HDL-C levels in men that exercised at or above 75% heart rate maximum (HRmax), 3 times a week for 12 weeks. No changes in HDL-C were reported in the subjects that exercised at 65% HRmax. The authors concluded that an intensity of 75% HRmax or above is necessary to increase HDL-C levels in men. In addition, Kokkinos and colleagues (1995) studied 2906 men and reported that increases in HDL-C levels occurred in men jogging at an exercise intensity of 10 to 11 minutes per mile. Although a specific exercise intensity threshold has not been defined, it appears that moderate intensity exercise is sufficient to raise HDL-C levels in men.

Exercise Intensity Threshold - Women

Exercise training studies attempting to assess the role of exercise intensity on HDL-C in women are few and report conflicting results. Most of the research suggests that women (pre and postmenopausal) with low levels of HDL-C are more likely to respond positively to exercise training. Duncan et al. (1991) reported similar increases in HDL-C levels in women (29-40 years) following 24 weeks of walking (4.8 km/session), regardless of

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intensity. This finding suggests that moderate exercise will raise HDL-C levels as much as intense exercise. In addition, Spate-Douglas and Keyser (1999) reported that moderate-intensity training over a 12-week period was sufficient to improve the HDL-C profile, and high-intensity training appeared to be of no further advantage as long as training volume (total walking distance per week) was constant. Conversely, Santiago and others (1995) reported no changes in HDL-C levels in women following 40 weeks of endurance training similar to the program in Duncan's study. However, the women in Santiago's study had higher initial HDL-C levels than the women in Duncan's study (65 vs. 55 mg/dl). These findings also support that women with lower levels of HDL-C are more likely to see increases in HDL-C with exercise training.

The research in postmenopausal women is also limited but provides positive results. Lindheim et al. (1994) reported increased HDL-C levels in postmenopausal women that exercised at 70% HRmax for 24 weeks and were on hormone replacement therapy (HRT). Interestingly, no increases in HDL-C levels were reported for the exercise only group. This finding suggests a synergistic relationship between exercise and HRT. Similarly, Seip and colleagues (1993) found significant increases in HDL-C levels in postmenopausal women following 9-12 months of endurance training at 80-90% HRmax. In addition, King et al. (1995) assessed the effects of high and low intensity exercise programs on HDL-C levels in sedentary women not receiving HRT. Although no significant increases in HDL-C were observed during year 1, by the end of year 2 subjects in both exercise groups showed small but significant increases in HDL-C levels. Interestingly, the increases were highest for subjects in the low-intensity group. The authors suggested that this was a result of exercising more days per week and concluded that frequency of participation may be particularly important for increasing HDL-C levels in women. The results of these studies suggest that habitual low to moderate intensity exercise may increase HDL-C levels in postmenopausal women with or without HRT.

Exercise Volume Threshold - Men

The volume or amount of exercise performed per week may also influence the magnitude of change in HDL-C levels. Most of the exercise training studies identify a weekly mileage threshold of 7 to 10 miles/week for significant increases in HDL-C. Wood and colleagues (1983) suggested that a threshold of running approximately 8 miles per week over a 1-year period is necessary to increases in HDL-C levels. In addition, Williams et al. (1982) reported that plasma concentrations of HDL-C generally did not begin to change until a threshold exercise level of 10 miles per week was maintained for at least 9 months. Kikkinos and others (1995a) reported significantly higher HDL-C levels in runners that averaged 7 to 10 miles per week. An additional study by Williams (1998) suggested that exercise volume is more important than exercise intensity. He reported that weekly mileage was more strongly correlated to HDL-C levels than exercise intensity. Interestingly, a higher volume of exercise provided significant increases in HDL-C in a shorter period of time. This indicates that there may be a relationship between exercise volume and the length of the training program. For non-runners a caloric expenditure above 1000 kcals per week has also been defined as a threshold dose of exercise to increase HDL-C levels (Drygas et al. 2000). These authors also noted that energy expenditure of &Mac179; 2000 kcals per week is associated with additional increases in HDL-C and that there may be a dose-response relationship between exercise and HDL-C levels.

Exercise Volume Threshold - Women

In women, the volume of exercise seems to be more important than the intensity of exercise for influencing HDL-C levels. Most studies suggest a large volume of exercise is necessary for significant HDL-C changes in women, however, the exercise volume threshold has not yet been defined. Generally, physically active women exhibit higher levels of HDL-C when compared to their sedentary counterparts (Kikkinos & Fernhall 1999). In a study by Kikkinos et al. (1995b) women who were categorized in a moderate and high fitness category, as assessed by an exercise tolerance test, exhibited higher HDL-C levels than those who were

categorized in a low fitness category. Additionally, elevated HDL-C levels have been reported in women following a high-volume training program (Williams 1996, Williams 1998) but not for those in a low-volume training program (Brownell et al. 1982). Williams (1996) reported that HDL-C concentrations increased significantly in relation to the number of kilometers (km) run per week in premenopausal women and postmenopausal women, whether they were receiving HRT or not. He also noted substantial increases in HDL-C in women who ran more than 64 km/week (37 mile/wk) when compared to those who ran less than 48 km/wk (30 mile/wk). These findings also suggest a dose-response relationship between exercise and HDL-C levels.

In post-menopausal women, the research is limited and conflicting. Sunami et al. (1999) reported a positive correlation (r=.63) between the total weekly exercise duration and HDL-C levels. The post-menopausal women in the study exercised at 50% of VO2 max for 60 minutes two to four times a week. This finding suggests that moderate intensity exercise is sufficient to increase HDL-C levels in post-menopausal women as long as exercise duration and frequency are sufficient. In contrast, Ready et al. (1996) found that walking at 60% VO2 peak (VO2 peak is similar to VO2 max, but without all criteria met for a max test) for 60 minutes had no influence on HDL-C levels in post-menopausal women, regardless of frequency.

Conclusions

Most studies suggest that endurance exercise is positively associated with increases in HDL-C levels in men. However, in women the relationship between endurance exercise and HDL-C levels is less clear. The response of HDL-C levels will differ for each individual depending on the intensity, duration and frequency of exercise, the initial HDL-C level, and the length of the training period. There may be an exercise threshold for exercise intensity, weekly amount of exercise, and length of the training period, that must be met before changes in HDL-C are evident. This has yet to be acceptably elucidated.

Exercise Prescription

The aerobic exercise prescription should be individualized based on the health and/or fitness level of the client. The exercise prescription should be progressively introduced to individuals that are relatively sedentary and/or overweight. A general goal to work up to is a weekly caloric energy expenditure of &Mac179; 1000 kcals (Drygas et al. 2000).

Intensity & Duration of Exercise

The exercise prescription should involve continuous aerobic activities using large muscle groups. The exercise intensity should begin at a low to moderate level, depending on the fitness level of the client. As the client gains aerobic endurance intensity can be progressively increased. ACSM (1998) recommends an exercise intensity of 55-90% of maximal heart rate or 40-85% of heart rate reserve. The duration of activity will depend on the initial fitness level of the client and the client's preferred exercise intensity. The exercise prescription should begin with approximately 20 minutes of continuous exercise and may progress up to 60 minutes (ACSM 1998).

Frequency

The optimal training frequency appears to be 3 to 5 times per week (ACSM 1998). If a dose-response relationship between exercise and physical activity exists, it appears that clients should strive to exercise 5-7 days per week.

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A COMPARATIVE STUDY OF VISUVAL REACTION TIME AMONG KHO-KHO AND KABADDI PLAYERS AT UNIVERSITY LEVEL

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INTRODUCTION

The amount of time it takes for a person to react. Reaction time is one of the important methods used to study person central information processing speed and fast coordinated peripheral movement response. Ability to respond physically and mentally to external stimulity. Reaction time farers to the amount of time it takes a human to make a physical response to a stimulus. A number of physiological and psychological factors influence an individual's reaction time. Reacting quickly is an important skill for many daily activities such as driving 'athletics' sprinters and train to improve their reaction time to get competitive edge on their competitor's. There is a certain time period between application of stimulus and appropriate motor response. Visual reaction time is time required to response to visual stimuli. During day to day life majority of motor work is done by using visual information of surrounding. Reaction time is having mainly two components.

1) **Mental Processing Time**:

Which is the time required for responder to perceive stimulus, identify and analyzing and stimulus and decide the proper motor response.

2) **Movement Time:**

It is the time required to perform movement after selection of response. Wellford and luce described three types of reaction time.

3) **Recognition reaction time**: Here there are some stimulity that should be responded to and other that should not get response.

3) **Choice reaction time**: Here there are multiple stimulus and multiple responses.

Purpose:

The aim of the present study was to find out the status of visual reaction time among Kho-Kho and Kabaddi players. Much is known about beneficial effect of exercise of various systems and overall health, little research has been done the effect of exercise on mental functions. Kho-Kho and Kabaddi players must have proper and quick responses during the game. They have to the attack opposition player in proper direction.

Methodology:

The present study was contented in fifty. Kho-Kho and Fifty Kabaddi players of Rayalaseema University, Kurnool, Andhra Pradesh. Personal and Medical history of both groups was collected in pre-designed Performa. Medical history was rules out any medical or surgical disease with would affect reaction time of Reactions time was measured with multiple choice appafratus653mp (reaction time apparanties) with accuracy of to.001 seconds. Visual reaction time was measured under two categories.

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1) **Simple Visual reaction Time**: Where subject has to respond to visual stimuli by pressing Key.

Subjects was given practice session in which the subject responded to visual stimuli till near about constant values of reaction time come in Then visual stimuli were given For three times and minimum reaction time was taken as a Final reaction time for that sensory modality of that subject. Data was collected & was statistically analyzed. After the data collection the mean, S.D and t-ratio was computed to Find out the Statistical significance. The level of confidence was fixed as 0.05.

Results: Visual reaction time found to be significantly (P-valueless than 0.05) less in Kho-Kho player's in simple reaction time task (Table.1).

Table: Difference in simple visual reaction time in 50 Kho-Kho and 50 Kabaddi player's.

VRT 'SIM PLE' (Kho-Kho player's	VRT 'SIMPLE' Kabaddi player's	P-VALUE
0.15720 to 02433	0.13690 + 0.02423	Significant

Table: (1) Explain that the difference in the simple visule reaction time among time among Kho-Kho & Kabaddi players. The obtained value of 0.15720+ 002423 and 0.13690+ 0.02423 showed Kho-Kho players significantly better than the Kabaddi players.

Visual reaction time Found to be significantly (P-Value) less than 0.055 less in Kho-Kho player's as compared to Kabaddi player's in choice reaction time task (Table-2).

VRT "CHOICE" (Kho-Kho player's	VRT Simple (Kabaddi player's)	P-VALUE
0.29858. to. 07461	0.27736 + 0.06463	Significant

Table-2: Explain that the difference in the choice visual reaction time among Kho-Kho & Kabaddi player's the obtained value of 0.298-58+0.07461, 90.27236+0.06463 showed Kho-Kho players significantly better then in Kabaddi players.

Discussion: The respect of present study indicates the difference in performance of two groups namely. Kho-Kho and Kabaddi players. Kho-Kho players were found to have significantly faster reaction time than Kabaddi players. Reaction time is an important indicator of speed of response to any stimuli. It requires being as less as possible in case of sports. Results of the present study can be compared with the past literature. "Found in his study participants who completed a six months aerobic exercise program exhibited improvement in reaction time.

Dustman, Emerson etal: Found that Exercise. Ripoll and stein suggest that athletes have better reaction time as compared to Kho-Kho players. Castalia and Unit Found that athletes were significantly Faster than athletes on incorrect trails the required their parties pats to direct their attention left + right or above the point of Fixation.

Kho-Kho players have to give a good attention to the stimuli and has to be alert to give a proper motor response. Motor response execution is a physical talk, so it is logical that people trained in physical reactive sports like Kho-Kho may have superior ability to select a correct motor response. Although the mechanism behind exercise and human information processing not been exactly identified. There are several possible mechanisms which provide primary support for different hypothesis. Different direct and indirect mechanism could explain relationship between exercise and mental processing. Perhaps the most popular mechanism is the idea the individuals who exercise at moderate to intense levels have higher rates of cerebral blood flow. This increased amount of blood Flow in the brain results in improvements in cognitive functioning due to increased supply of necessary nutrients, such as oxygen and glucose. Research on trained athletes whose sports require high level of motor reactivity suggests that physical reactive sport players have superior reaction time compared to Kho-Kho and Kabaddi players.

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The quicker reaction time in Kho-Kho players compared to Kabaddi players in due to improve concentration, better muscular co-ordination and improved performance in speed and accuracy task.

Conclusion: It can be concluded that the reaction time is a good indicator of performance in sports as the athletes performed better in the reaction time tasks. The study concluded that persons involved in sports are having good reaction time as compared to Kho-Kho, Kabaddi players. Now children are more involved in video games like indoor games whills involvement in outdoor game would not only make them physically healthy but would also improve. Their alertness, concentration and ultimately reaction time, which would also be helpful them in day life.

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MODERN TRENDS IN FITNESS

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INTRODUCTION

Physical Fitness is a general state of Health and well-being or specifically the ability to perform aspects of Sports or occupations. Physical fitness is generally achieved through correct Nutrition, Exercise, hygiene and rest. It is a set of attributes or characteristics that people have or achieve that relates to the ability to perform physical activity. Before the Industrial revolution, Fitness was the Capacity to carry out the day's Activities without undue Fatigue. However with automation and changes in lifestyles Physical Fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypo kinetic diseases, and to meet emergency situations.

Physical fitness is the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel and do our best. More specifically, it is "the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well being" Physical fitness involves the performance of the heart and lungs, and the muscles of the body. And since what we do with our bodies also effects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability.

Cross Fit Training

Cross Fit is a type of high intensity workout that offers a full-body strength and conditioning workout by combining aspects of:

- weight Training
- HIIT
- Plyometrics
- boot camps
- sprinting
- gymnastics

Benefits

Benefits of Cross Fit

- workouts vary from day to day so you will never get bored
- Cross Fit gyms foster working out in a team environment. This can help give you some much-needed motivation to get through your workout
- Cross Fit gyms are readily available in all major cities across the United States
- trainers also offer nutrition recommendations and tips

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BARRE FITNESS

The ballet-inspired workout called Barre uses small, isolated movements to improve flexibility and develop long, lean, and strong muscles. The classes usually involve lots of repetitions of small, pulsing movements. The classes target the muscles in the core and lower body.

Benefits of Barre

- it's a good choice for people who enjoy dancing or used to take dance classes as a kid
- the core training improves balance and stability
- it aims to develop long and lean muscles

BODY WEIGHT TRAINING

An expensive gym membership is no longer required to stay in shape. One of the leading fitness trends requires nothing more than your own body weight. Body weight training is a method that uses the body's own weight as the source of resistance for strength training and muscle endurance. Commonly used exercises in body weight training involve push-ups, planks, lunges, and crunches.

The benefits of body weight training:

- it uses minimal equipment (if any at all)
- it's great for a beginner who may be intimidated by heavy weights
- individual bodyweight exercises can be advanced or regressed to meet your needs
- Since body weight provides the only form of resistance, the program can be done anywhere – at home, at the gym, or in a park, for example. It's perfect for people who travel frequently

YOGA

Yoga has been part of the Indian spiritual tradition for thousands of years. It's based on Indian philosophy of breathing, flexibility, and postures to help unite the mind, body, and spirit. There are thousands of studies validating the benefits of yoga. Yoga has even become a therapy used in conjunction with modern medicine. However, if practiced incorrectly or too strenuously, it can lead to injury. Yoga is the physical, mental and spiritual practices or disciplines which originated in ancient India with a view to attain a state of permanent peace. Yoga is discussed quietly in Upanishads, many of which predate "Patanjali Sutras". "Patanjali" is widely regarded as the complier of the formal yoga philosophy. The actual term yoga first occurs in "Katha Upanishad" and later in "Shvetasvatara Upanishad". Diffused pre- philosophical speculations of yoga begin to immerge in the texts of 500-200 BC such as the Middle Upanishads, Bhagavad-Gita and Mokshadharma of Mahabharata. During the period between the Mouryan and The Guptas era philosophical schools of Hinduism, Buddhism and Jainism were taking form and a coherent philosophical system of yoga began to emerge.

- The term Yoga means "Union" in Sanskrit.
- The term Yoga derived from Sanskrit roots "Yujar [to yoke]" or "Yuj Samadhana [to concentrate]".

BENEFITS OF YOGA:

- Improved concentration leading to better grades
- Balanced Blood Pressure
- Decreased Absenteeism & Tardiness
- Improved Interpersonal Relationships
- Enhanced Confidence Level
- Sharper Brain
- Leads to total health of the body.
- Calms the mind.
- Improves mental strength and perception.
- Increases concentration.

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- Several asanas increase the strength of many muscles and improve the efficiency of all
- Weight Management:
- Balance

THERABANDS TRAINING IN FITNESS

Fitness is the state or condition of good health, especially good physical condition resulting from exercise and proper nutrition. It consists of several components such as strength, endurance, flexibility, agility, coordination, balance, power. The therabands are devices which help the athlete maintain and improve his fitness. The therabands are 6 inches wide latex bands which come in different colour coded resitance levels, distinguished by the thickness of the bands. The therabands are resistance bands which are made up of durable rubber latex/latex free material widely used for strengthening, general conditioning and rehabilitation of the athletes. These are commonly used by athletes, specifically dancers to strengthen and stretch the feet under the direction of a physiotherapist before moving on to free weights or weight machines. Theraband exercise requires excellent posture, warming up and stretching, similar to most strength training programs.

Characteristics of therabands: *Versatility*, Portability, *Elasticity, Economy, Quality*

Usage of Therabands: Therabands are becoming more popular in gyms and fitness classes. These are normally used for muscle training and recovery after an injury and prolonged weakness. If an athlete is unsure how to maintain a position with free weights that is safe for shoulder, back, elbow, knee and ankle joints, one should begin using the therabands under the direction of a physiotherapist.

SWISS BALL TRAINING IN FITNESS

Swiss ball develops abdominal muscles, stabilizes lower back as well as improving posture. There are many different names for the swiss ball namely , exercise ball, gym ball, fitness ball, stability ball, gymnastic ball, yoga ball, body ball, physio ball .The reason it is called a swiss ball is that it originated from Switzerland inthe1960s and therapist used it for physical rehabilitation

BENEFITS OF SWISS BALL

The Swiss ball is one of the most versatile pieces of exercise equipment. It can be added to many exercises to make them more challenging by, requiring more stability, the benefits of the Swiss ball are

- Recruits all of the muscles, integrating strength, flexibility and coordination in one activity
- Provides a great core workout
- Provides stimulation to the brain and nervous system.
- Improves balance and coordination.
- Improves posture

Swiss ball provides a slightly unbalanced plat from to work on, so the body is constantly challenged to find balance and equilibrium every time it is used in an exercise. This means the stabilizer muscles are instantly contracting at very deep level. A general rule is, as the practioner sit on the ball; legs should form a 90ºangle at the knee. Thighs should be parallel to the ground and ankles under the knees. A Swiss Ball stimulates all those little but essential muscles that help maintain a healthy posture. This is because you must maintain your centre of ravity, so that you don't fall off the ball. Strengthen your Core - Using a Swiss Ball requires constant and consistent recruitment of the core musculature and as all movement is initiated and supported by the core, a stronger core leads to stronger extremities (arms and legs).Improve your Balance and Stability- During regular daily activities your body is challenged by many forces in all dimensions. Since most machines are anchored to the floor they do not recruit your stabilizer muscles, dumbing down your ability to control your body's

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movement. Swiss Ball Training encourages you to recruit your core muscles to manage these forces improving balance, co-ordination and stability. Improve Nervous System Activation - Swiss Balls provide an enriched training environment which challenges the nervous system and improves your ability to react to a changing base of support. Effective Rehabilitation - Because Swiss balls are naturally unstable, sitting, exercising or balancing on it activates a myriad of motor recruitment patterns, increasing muscle awareness. This is particularly beneficial when rehabilitating because often muscles can be inhibited as a result of injury.

CORE BOARD TRAINING IN FITNESS

Core training is a multi-dimensional training programme done on a unique, reactive surface to enhance human performance and functional strength. The term 'core training' can be confusing, some refer to core training as any training focused at the central (trunk) region of the body, which includes the abdominals, hips and back. Other refers to core training as the centralized or fundamental movement patterns from which all other movement patterns are derived. To combine these two approaches to core training, Reebok University created a reactive exercise training programme that focused on performance enhancement for athletic activities and activities for daily livings. Reactive exercise training demands an increase in synergistic muscle activity that is necessary to provide the appropriate levels of joint stability and mobility improved muscle synergy in proximal muscle groups should increase the quality of movements in the limbs. Repeated core muscle training may reinforce proper muscle sequencing and muscle memory patterns, which in turn should permit a more aggressive approach to the prevention and treatment to musculoskeletal injuries. Core strength is essential during sports and fitness training.

BENEFITS OF CORE BOARD

Core pilates is versatile, giving instructors and personal trainers a variety of formats to choose from including a one hour group class, a personal training session or circuit training.Core pilates offers a large variety of movement options including twenty nine exercise and nine stretches, each with several levels of difficulty, making the benefits of the program accessible to participants all along the spectrum of conditioning and motor control. Core Pilates satisfies the critics for a mind / body fitness activity. The extensive variety of exercise ensures that participants will sustain interest in the program appreciating the mental stimulation as well as the physical challenge.

CONCLUSION

Fitness improved physical and psychological and physiological and Healthy modern trends is able to help a person have control over their body through control of their mind. As such, modern trends can play a key role in cultivating mind control and concentration which helps a sportsperson to perform at their peak level.

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A RELATIONSHIP BETWEEN SPORTS ACHIEVEMENT MOTIVATION AND SPORTS COMPETITION ANXIETY OF NATIONAL LEVEL HANDBALL PLAYERS

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INTRODUCTION:

In the games and sports, psychological and physiological factors play an important role in determining the performance level (Grange & Kerr ,2010;schilling & Hyashi, 2001). Numerous studies have demonstrated the impact of psychological factors on sports performance (Crespo,2002). Achievement motivation and Anxiety have been two of those factors under consideration . Taylor (1994) treated motivation as the base of a pyramid towards success in sports. Other important factors in this area include 'goal orientation','goal setting', 'motivational climate'(Boyce et al., 2001; Van, 1994) and 'burnout (Gould et al., 1997;1996;). We know that players have multiple motives for continued participation, such as competence, friendship skill improvement and competition (Weiss &Chaumeton,1992).

There are many studies conducted in the aspect of achievement motivation and its effect on performance. Studies suggest that achievement motivation is most significant predictor of performance and essential to participate in a competition (Huschle, et.al. 2008;Carey, et al.2000).Several motivation theories in the academic area have been adopted in the quest for greater understanding of achievement motivation in sport (Ames, 1984,1992;Dweck,1986;Nicholls,1989).

Motivation is an essential element of human personality . It directs a person's activity and makes it more or less dynamic. Without the desire to succeed other psychological features and abilities do not provide nearly so much influence on performance. Achievement motivation influences other factors affecting performance in sport like: physical preparation, technique, tactics and even life style.

Anxiety can be described as the tension and worry that results from distress. Anxiety is a negatively charged emotional state characterized by discomfort and nervousness. Generally speaking, there are two forms of anxiety trait and state. Trait anxiety is a personality characteristic that is relatively stable over time, predisposing the individual to be anxious across a wide variety of situations. State anxiety, on the other hand, refers to a "right now" kind of anxiety that is situation –specific. One of the factors that are believed to have a significant effect on athletic performance is the level of state anxiety experienced prior to an athletic contest. This is referred to in the literature as pre-competitive anxiety.

Athletes cannot perform at their best like they usually do because of anxiety. Consequently, their performance is affected during the competition and they seldom achieve victory.(Papanikolaou, et al.2008). Therefore, there is a need to give a positive thinking and better mental skills to solve the problems that may arise because of anxiety. If it is not handled well or misinterpreted, the athlete will lose control and their performance will decrease. (Hardy & Fazey, 1987;Martens, et.al.1990;Gualberto&Wiggins,2008).Several researchers including Singer (1980), Cratty (1979) examine the relationship between anxieties and learning states that "performance improves with increasing levels" where upon further increase in arousal cause performance impairment.

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The relation between anxiety and performance has been the subject for many researchers (Craft, et.al.2003;Parfitt&Pates ,1999). Studies showed that the high experienced player would show lower levels of anxiety than the low experienced player. As far as handball is concerned, Roguli, et.al.(2006) supported that it is a sport, which includes complex and accurate motor skills, and they suggested that psychological factors play a decisive role in a competition, differentiating between successful and less successful teams. The purpose of the present study was to evaluate the relationship between competitive trait anxiety and achievement motivation in National level Hand ball players.

METHODOLOGY

Sample

The sample of the present study was drawn from the 58th National School Games Federation Handball tournament held at Harayana, India. For the purpose of the study 50 National level players were randomly selected from the tournament.

Procedure

Sports Competition Anxiety Test (SCAT) developed by Martens (1977) was administered to measure the sport competition Anxiety and Sports Achievement Motivation Test developed by Kamlesh(1990) was administered to measure the achievement motivation of the players.

STATISTICAL PROCEDURE

Mean, standard deviation, and Pearson Product Moment Correlation were computed to analyze the data at .05 level of significant.

RESULTS

Table 1. Relationship between Achievement Motivation and Trait Anxiety of National Handball Players.

Variables	Mean	SD	Cal.r
Trait Anxiety	20.75	3.44	-0.48
Achievement Motivation	28.84	5.99	

Significant at 0.05 level of confidence Tab .r = 0.44

Data revealed that significant negative relationship between trait anxiety and achievement motivation i.e. achievement motivation and competition anxiety are negatively correlated to each other.

DISCUSSION AND CONCLUSION

From the result of the study it was concluded that there was significant negative relationship between Achievement Motivation and Trait Anxiety at .05 level of significant i.e. Study showed that increase or decrease of level of Achievement Motivation do effect on the Increase or decrease of level of Anxiety or vice-versa. Therefore we can say that players who have high level of Anxiety should also have low level of Achievement motivation or vice-versa. Result of the study endorses the findings of Bawa and Kalpana (2001) who conducted the study on male national level Gymnasts and found that higher level performance group has moderate level of anxiety than the low level performance group, Unierzyski(2003) investigated the level of achievement motivation of young tennis players and their future progress and examine the influence of achievement motivation on tennis performance. He found in his study that the players who later reached international level in tennis possessed significantly higher level of achievement motivation than the players who never reached international level.

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RDT HOCKEY ACADEMY ADAPTED SCHOOLBOYS PHYSICAL FITNESS STATUS IN THE RAYALASEMA DISTRICT OF ANDHRA PRADESH

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ABSTRACT

This investigation was purported to evaluate the Physical Fitness Status of Schoolboys adapted by RDT Hockey Academy in the Rayalasema District of Andhra Pradesh, India. For this reason, 916 schoolboys from thirty-two (32) schools in four (4) different districts adapted by RDT hockey academy in the Rayalasema District of Andhra Pradesh, India were considered as subjects. These subjects were in the age group of 11 to 16 years, and they were assessed for their physical fitness status. The fitness parameters were restrained to height, weight, speed, explosive power, flexibility, agility and cardiorespiratory endurance using standardized tests and procedures. The data collected were subjected to statistical analysis by means of One-way ANOVA, and Bonferroni corrections post hoc test. The confidence interval was fixed at $P<0.05$ in all cases. The research findings ensure statistically considerable age difference on selected variables, and it implies that age differences influence almost all fitness parameters.

INTRODUCTION

In India, for centuries of years from Vedic age to till date, the gurukuls and schools have played a vital role in the provision of physical activity to children and youth. Now a day, physical education is a mandated part of the school curriculum that too particularly in the State of Andhra Pradesh, India, and it is obligatory to assess and report the level of school student's fitness. The educational aspects of physical education are to develop the knowledge, behavioral skills, and motor skills necessary to develop and maintain a physically active and healthy lifestyle. As such, the priority for physical education is seen as providing opportunities for students to engage in enjoyable physical activity, to become physically fit, and to learn generalizable motor and behavioral skills (McKenzie, 2003). Yet, participation in physical education was reduced by substitutions of other activities for physical education and student exemptions.

Customarily, the role of schools in providing and promoting physical activity has been during the school day and on the school campus immediately after school hours. Although there have been exceptions, school-based programs usually have been sponsored by the schools themselves and supervised by school employees. However, enormous potential appears to exist for schools to expand their role in providing students with additional physical activity by building institutional relationships with community-based providers of physical activity. Such relationships could manifest in several ways. Schools can make their facilities available to community based organizations during after-school, weekend, and summer vacation. Also, schools can

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collaborate with community organizations in promoting physical activity programs to students and their parents. Because transportation can be a barrier to students' participation in after-school programs, schools can collaborate with community organizations, including transit authorities, to ensure that students have the opportunity to participate in programs beyond the school day.

Although school-community linked physical activity programs offer much promise, little research has addressed the efficacy of such initiatives for increasing physical activity in children and youth. The nurturing of young players was carried out by Rural Development Trust (RDT), an NGO based in Anantapur, Andhra Pradesh, India. RDT Hockey academy benefited many young players across Andhra Pradesh, by adapting the students of various schools. Thereby, an attempt was made to record and report the physical fitness status of schoolboys of different ages adapted by RDT hockey academy in the Rayalasema district of Andhra Pradesh.

Methodology

In this study, nine hundred and sixteen (916) male school students, aged 11 to 16 years were selected as subjects, at random from the schools adapted by RDT hockey academy spread across the district of Rayalasema, Andhra Pradesh, India. The selected subjects were tested for their physical characteristics (*height and weight*) and fitness capabilities (*speed, explosive power, flexibility, agility and cardiorespiratory endurance*) using standardized tests and procedures. The data collected were subjected to statistical analysis by means of One-way ANOVA, and Bonferroni corrections post hoc test. The confidence interval was fixed at $p < 0.05$ in all cases.

Results

The data on height, weight, speed, explosive power, flexibility, agility and cardiorespiratory endurance were analysed for statistical significant age difference using one-way ANOVA. Thereafter, post hoc tests were performed using Bonferroni corrections. All those results were tabulated in tables from 1 through 3.

Table – 1: Mean and Standard Deviations on Anthropometric Measurements and Physical Fitness Components

Variables	Descriptive	Age Groups					
		11 yrs	12 yrs	13 yrs	14 yrs	15 yrs	16 yrs
	N	112	222	249	196	99	38
Height	Mean	137.34	142.38	147.54	150.82	155.35	161.66
	SD	7.05	7.94	9.11	9.32	8.96	7.19
Weight	Mean	27.74	31.03	34.22	37.21	41.19	46.11
	SD	4.98	6.27	7.31	7.00	7.90	7.25
Speed	Mean	5.78	5.75	5.54	5.41	5.51	5.45
	SD	.52	.57	.63	.64	.57	.52
Explosive Power	Mean	1.48	1.55	1.61	1.68	1.72	1.87
	SD	.16	.18	.21	.25	.23	.23
Flexibility	Mean	3.63	4.15	5.59	5.69	7.00	7.53
	SD	2.86	3.34	4.09	4.21	4.94	5.36
Agility	Mean	18.40	17.81	17.08	16.56	16.74	15.61
	SD	1.48	1.70	1.62	1.74	1.89	1.47
Cardiorespiratory Endurance	Mean	3.79	3.67	3.51	3.48	3.44	3.51
	SD	.58	.55	.53	.68	.72	.67

The descriptive statistics depicted in Table 1 reveals that all the variables confined to this study improved with age of the schoolboys. However, the speed, agility and cardiorespiratory endurance of the schoolboys were slightly impinged at the age of 15 and 16 years, which might be the result of academic stress, lack of motivation, sports performance saturation, gain in body mass, so on and so forth that needs to be investigated further.

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Table – 2: Analysis of Variance on Anthropometric Measurements and Physical Fitness Components

Variables	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Height	Between Groups	33166.969	5	6633.394	90.449	.000
	Within Groups	66737.778	910	73.338		
Weight	Between Groups	18807.955	5	3761.591	80.890	.000
	Within Groups	42317.551	910	46.503		
Speed	Between Groups	18.145	5	3.629	10.275	.000
	Within Groups	321.401	910	.353		
Explosive Power	Between Groups	7.380	5	1.476	33.143	.000
	Within Groups	40.528	910	.045		
Flexibility	Between Groups	1127.764	5	225.553	14.216	.000
	Within Groups	14437.968	910	15.866		
Agility	Between Groups	446.681	5	89.336	31.856	.000
	Within Groups	2551.975	910	2.804		
Cardiorespiratory Endurance	Between Groups	12.098	5	2.420	6.599	.000
	Within Groups	333.643	910	.367		

Table 2 shows that statistically significant difference exists between different ages on height, weight, speed, explosive power, flexibility, agility and cardiorespiratory endurance as the obtained F (5, 910) = 90.449, 80.890, 10.275, 33.143, 14.216, 31.856 and 6.599 respectively , ($p < 0.05$). Since, six different age categories were considered in this study, the statistical analysis was further continued to post hoc test using Bonferroni corrections to find out the paired mean differences, and it was given Table 3.

Table – 3: Post Hoc Tests on Anthropometric Measurements and Physical Fitness Components

Age in Years		Height	Weight	Speed	Explosive Power	Flexibility	Agility	Cardio Respiratory Endurance
I	J							
11	12	5.039*	3.286*	0.027	0.068	0.515	0.584*	0.113
	13	10.199*	6.476*	0.237*	0.125*	1.952*	1.319*	0.281*
	14	13.477*	9.473*	0.370*	0.199*	2.055*	1.843*	0.308*
	15	18.014*	13.451*	0.269*	0.238*	3.366*	1.657*	0.344*
	16	24.319*	18.364*	0.326	0.388*	3.892*	2.789*	0.281
12	13	5.160*	3.190*	0.210*	0.057	1.438*	0.735*	0.168*
	14	8.438*	6.187*	0.343*	0.132*	1.540*	1.259*	0.196*
	15	12.975*	10.165*	0.242*	0.170*	2.851*	1.074*	0.232*
	16	19.280*	15.078*	0.299	0.321*	3.378*	2.206*	0.169
13	14	3.278*	2.997*	0.133	0.075*	0.102	0.524*	0.028
	15	7.815*	6.975*	0.031	0.113*	1.414*	0.338	0.064
	16	14.120*	11.888*	0.089	0.264*	1.940	1.470*	0.001
14	15	4.537*	3.978*	0.101	0.038	1.311	0.186	0.036
	16	10.842*	8.891*	0.044	0.189*	1.838	0.947*	0.027
15	16	6.304*	4.913*	0.058	0.151*	0.526	1.132*	0.063

From Table 3, it is understood that almost each of the paired mean differences on height, weight and agility varied between ages. It is also found that the adjacent age categories didn't vary considerably between

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them with regard to speed, explosive power, flexibility and cardiorespiratory endurance, while the speed, flexibility and cardiorespiratory endurance of the boys aged 14 to 16 years were not good enough as it is supposed to be.

Partaking in games and sports has long been assumed to provide health benefits to young players. In spite of certain reservations about this conjecture, the studies of some (Rossi *et al*., 2004; Skolnick, 1993; Aaron *et al*., 1995) have shown that health benefits accrue to young people who participate in sports. The results of the present study exhibit a mixed trend influence of sports participation.

Conclusion

The findings of this study reveal that most of the boys adapted by RDT hockey academy are getting taller and heavier with age, which ensures that the growth and development process were not hindered by means of systematic training program adopted in the academy. But, the result of this study necessitates rigorous training regimen for improving the physical fitness status of boys with regard to their age, as most of the fitness parameters level were not evidently varied among age categories of schoolboys adapted by the hockey academy.

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PSYCHLOGICAL TEMPERMENT OF WOMEN STUDENTS TOWARDS PARTICIPATION IN PHYSICAL EDUCATION

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1. INTRODUCTION

Women are facing health and fitness problems due to modern life style. Women who participate in sports programmes are found to be healthier. The climate must be created in which sports and fitness is given importance for everyone, and in which every one's abilities are tested and respected. Cardiovascular endurance will be increased by physical exercises and decreases the chances of heart attacks, strokes, back problems, osteoporosis and other health problems. The self esteem of young women will be increased by the participation in sports activities. The parents influence is very important to go for physical activity. Parents can help by insisting colleges to provide good sports infrastructure and facilities to their children. The Participation of women in any sports is influenced by a variety of Societal, economic, demographic, technologic factors. Sports Psychology is the study of the psychological factors that influence participation and performance in sports. Sports psychology today is an online sports training to educate athletes, parents and coaches to excel in sports. Physical talent alone does not bring success in sports. Confidence, mental toughness, attitude leads them to victory. The fallowing factors effects sports training and performance. 1. Motivation, 2 Arousal and Anxiety, 3. Personality, 4. Concentration, 5. Attitude. This paper titled "Psychological Temperament of Women Students Towards Participation in physical Education" identifies women students attitude towards physical education and the level of their interest to represent their institutions in games and sports meet. Now a days the parents and pupil are most concentrated to excel in academics rather than extra/ co curricular activities. The over concentration of parents on academic activity causes the corporate and private colleges to fail to provide the required facilities and environment for Physical Education. Even though the women student participated and achieved exclusive in the groups and the sports field. This paper established the women respondents attitude and level of participation in Physical Education. The findings will help in future, to establish a great sports environment in educational institutions.

Physical Education to be recognized to be a part of total education, as a phase of general education as a way of real education. The term "Education" implies the drawing out and development of all the powers of an individual - physical, mental, moral and social. Physical education is a part and parcel of general education and education will not be complete without physical Educational Physical education is an integral part of total education programme and makes a significant contribution towards the achievement of desirable education and health outcomes thorough the medium of physical activity. Physical education should aim to improve the students and to give them much strength, health and stamina as possible to enable them to perform physical activities. Physical Educators have to shoulder or take a major responsibility in the process of complete development of the individual. Physical Education teachers should think in terms of the recreational and health aspects of the Physical Education so that it becomes as active component of colleges and schools. Physical

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educators should identify the potentialities of students and train them to the extent possible. Physical education is an important form of non verbal communication like music drama and art. Physical education and recreational activities are the oldest arts in the humanities.

2. Aims and Objectives of Physical Education

Aim is a very general abstract destination which we strive to reach. Achievement of the aim is dependent on the achievement of certain practical major steps called objectives. Objectives are certain definite steps which lead us towards aim.

The aim of Physical Education is to develop the social, economic, psychological and civic aspects of life. They are.

1. Positive human relationships
2. Self-realization
3. Economic independence and efficiency
4. Civic responsibility

Physical strength and development of health and appearance refers to the word physical. Therefore Physical Education refers to the process of education that goes in the schools/colleges through all activities which develop and maintain the human body. Children develop skills and utilize their leisure time in a proper manner only by participating in Physical Education activities. Physical Education plays a projninent role in achieving benefits of exercise.

3. Review of Related Literature

According to Bucher, "Psychology of sports means applying psychological theories and concepts to the aspects of sports such as coaching. It is concerned with analysing human behaviour in various types of sport situations''. Many psychologists say that in a competition, competition is 10% physical and 90% mental. Hence the purpose of sports psychology is to understand, explain, predict and control behaviour of athletes. Kruger (1984) explained that sports psychology has emerged recently as a scientific discipline and is well on its way to get full scientific status all over the world.

Zigler (1984) says that the success and failure of an individual athlete depends upon the blending of physical ability, conditioning, training, mental preparation and the ability to perform well under pressure. It is not uncommon to hear, coaches and athletes! express disbeliefs on how poorly their team performed against a certain opponent, or how they fell apart in a crucial situation.

Singh (1992) says that the application of psychological principles to the improvement of performance in sport has received greater attention in these days. There are certain accepted psychological principles which have to be applied so that athletes and players are able to show their best in their performance. It is important to know about the role of emotional phenomenon like incentive motivation, state and trait anxiety and sport competition anxiety of the players during training as well as competitive situations. "Sports Psychology, as an emerging field of Psychology, is viewed as an attempt to understand describe and explain the behaviour of sports person in athletic setting both practice and competitive -with a view to enhance performance" (Kamlesh, 1998).

4. Statement of the problem

Attitude towards physical education\ and participation levels of professional and Non- Professional college women students in Visakhapatnam district is based on those students who participated in national/ international/ University tournaments and those who did Not participate.

5. Objective of the study

The objective of the present study are:

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1. To find out the attitude of women students towards physical Education and participation level of Professional and Non professional college Women students in Visakhapatnam District.
2. To estimate the attitude and participation levels of women students towards physical, family, social, psychological (emotional), philosophical, recreational and general aspects.

6. Hypothesis of the study:

1. There will be no significant difference among the women students basing on their age with respect to physical aspect, family aspect, social aspect, mental and emotional aspect, moral aspect, recreational aspect and general Aspect towards physical Education and Participation levels of professional and Non Professional women students in Visakhapatnam District.
2. There will be no significant difference between rural and urban area women students with respect to Physical Aspect, Family Aspect, Social Aspect, Mental and Emotional Aspect, Moral Aspect, recreational Aspect and General Aspect towards physical Education and Participation Levels of Professional and Non Professional College women Students in Visakhapatnam District.

7. Universe of the samples/ samples and sampling:

The samples respondents were belonging to Visakhapatnam district and pursuing second and final year degree students from professional and Non- Professional Colleges.

8. Variables of the study:

I. Age
II. Religion
III. Caste
IV. Parental income
V. Mother & Father Occupation
VI. Nuclear & Joint Family
VII. Professional/ Non – Professional
VIII. Management Colleges
IX. Co- Education/ Restricted Women's College
X. Rural or Urban

9. Construction of the tool

An opinionnaire was constructed for the women students to find out their attitude towards physical Education and their participation levels. The tool was prepared to collect the preliminary information about the women students' attitude and participation levels in terms of physical Aspect, Family Aspect, Social Aspect, Mental and Emotional Aspect, Moral Aspect, Recreational Aspect and General Aspect.

10. Data Collection

A brief orientation is given before handing over the tool to the women students. Necessary instructions are provided. No time limit is kept for answering the tool. In this study pilot study was conducted for 48 women students randomly selected from the Professional and Non-Professional colleges in Visakhapatnam district. Final data was collected from 240 Professional college women students and 240 from non-professional students, from colleges situated in Rural and Urban areas of the district. All the respondents are having different socio-economic and demographic backgrounds.

11. Statistical Techniques Used:

As the present study is of more of qualitative in nature, collected data were analyzed using both qualitative and quantitative techniques. Quantitative data were analyzed with the simple statistical techniques. The investigation has been carried out by the descriptive statistical analysis, such as calculating measures of central tendency like Mean and calculating measures of dispersion like Standard Deviation. For testing the null

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hypothesis, the 't' - test and Analysis of Variance have been used by the investigator. The't' test was used to test the null hypotheses when the data was correlated from matched groups. Analysis of (ANOVA) variance with Scheffe's Post Hoc Test was used to find out the effect, if any, of the variables studied. The data were coded and prepared for analysis using the statistical package for research software programme (SPSS).

12. Major Findings:

I. Women students had shown positive attitude in the aspects of Physical, Family, Social, Mental and Emotional, Moral, Recreational, General aspect and total attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

II. There is a significant relationship between different aspects of Physical, Family, Social, Mental and Emotional, Moral, Recreational and General except Physical and Family, Mental and Recreational towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

III. There is no significant difference between below and above 20 years age group women students with respect to Physical Aspect, Mental and Emotional and Recreational aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

IV. There is a significant difference between below and above 20 years age group women students with respect to Family aspect, Social aspect, Moral aspect, General aspect and total attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

V. There is no significant difference between Hindu, Muslim and Christian religion women students' perceptions with respect to Physical aspect, Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

VI. There is a significant difference between Hindu, Muslim and Christian religion women students' perceptions with respect to Family aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

VII. There is a significant (difference between OC, BC, SC and ST caste women students' attitude with respect to Physical aspect and Family aspect towards Physical Education and Participation levels of Professional and Noh-Professional College Women students in Visakhapatnam district.

VIII. There is no significant difference between OC, BC, SC and ST caste women students attitude with respect to Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

IX. There is a significant difference among women students attitude based on their parental income with respect to Physical aspect and Family aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

X. There is no significant difference among women students attitude based on their parental income with respect to Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

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XI. There is a significant difference among women students attitude based on their mother occupation with respect to Physical aspect and Family aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XII. There is no significant difference among women students attitude based on their mother occupation with respect to Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XIII. There is no significant difference among women students attitude based on their father occupation with respect to Physical aspect, Family aspect, Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XIV. There is a significant difference between Joint family and Nuclear family of women students' attitude with respect to Physical aspect and Recreational aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XV. There is no significant difference between Joint family and Nuclear family of women students' attitude with respect to Family aspect, Social aspect, Mental and Emotional aspect, Moral aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XVI. There is a significant difference between Professional and Non- Professional course of study of women students' attitude with respect to Physical aspect, Family aspect, Social aspect, Moral aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XVII. There is no significant difference between Professional and Non- Professional course of study of women students' attitude with respect to Mental and Emotional aspect and Recreational aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XVIII. There is no significant difference between Private, Aided and Government college women students' attitude with respect to Physical aspect, Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XIX. There is a significant difference between Private, Aided and Government college women students' attitude with respect to Family aspect and General aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XX. There is no significant difference between Co-education and Restricted women students attitude with respect to Physical aspect, Family aspect, Social aspect, Mental and Emotional aspect, Moral aspect, Recreational aspect, General aspect and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XXI. There is a significant difference among women students attitude based on their participation with respect to Physical aspect and Recreational aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XXII. There is no significant difference among women students attitude based on their participation with respect to Family aspect, Social aspect, Mental and Emotional aspect, Moral aspect, General aspect and

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overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

XXIII. There is no significant difference between rural and urban area women students' attitude with respect to Physical aspect, Family aspect, Social aspect, Mental and Emotional aspect, Moral aspect, and overall attitude towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

13. There is a significant difference between rural and urban area women students' attitude with respect to Recreational aspect and General aspect towards Physical Education and Participation levels of Professional and Non-Professional College Women students in Visakhapatnam district.

Conclusions:

I. Adequate facilities and equipment are essential to Physical Education.

II. Physical Education activity or programmes must meet individual and social needs Physical Education Programmes must be designed to suit the requirements of those participating them, as well as the institutional, socio-economic and climatic conditions of each districts in the state.

III. Physical Education Activity contribute to the maintenance and improvement of health, provide a wholesome leisure time occupation and gives opportunity to overcome the drawbacks of modern living.

14. Suggestions:

I. Parents should recognize the benefits which flow from an active and vigorous sports environment and encourage their children.

II. Principals of the colleges and management should encourage the Physical Education activities and their support is essential for implementation of Physical Education programme at collegiate level.

III. Sports are a service industry and generate a large number of jobs through direct or indirect employment. Games and sports reduce the academic burden in colleges. The sports culture will automatically spread hence, at least one hour programme to the introduced in professional colleges after their academic sessions.

IV. Introduction of rewards and incentives for participation in sports and games.

V. Adequate incentives should be provided to those who excel in sports.

VI. Encourage sports by creating conductive environment by using all media.

VII. Must conduct lectures on sports psychology often to create awareness.

VIII. Each and every college should have a play field. Steps to be taken by the government.

IX. Remedial academic classes to be arranged for the sports persons if they miss classes because of their participation in various games and sports.

X. In today's competitive world parents are more concerned to equip their children in highly skilled valued education to compete in today's technically emerged globalized world. But the parents should encourage women participation in games and sports to get recognition and health benefits.

XI. Physical education curriculum should strengthen the confidence of people in sport and Provide the conditions through which students understand the value of physical activity, perform it in all the life.

XII. Physical Education activity can provide entertainment and fun to the students.

XIII. If they don't pay attention to these physical education courses elements and students feel boring and pointless in these courses and activities, naturally tendency to sports and physical activity will decline among more students.

5. Limitations of the study

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Though measures have been taken to understand the basic issue of the study in a comprehensive manner and designed, the analysis was undertaken accordingly. Yet it is beyond the capacity of the researcher to meet certain requirements in this context. Consequently the study has certain limitations. These are:

I. The study was limited to women students' pursuing graduation courses in professional and non-professional institutions.
II. The study was confined to women students studying in colleges of Visakhapatnam District.
III. No control group method was used.

The samples were very specific and related to women members and their activities. The appropriate standard tests are not available. Hence the researcher constructed the Questionnaire and reviewed by subject experts. After pre-test the questionnaire was canvassed in the field.

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ANALYSIS OF THE CHANGES ON SELECTED PHYSICAL FITNESS AND PHYSIOLOGICAL PROFILES DURING TWO YEARS OF SYSTEMATIC TRAINING PROGRAM IN RDT HOCKEY ACADEMY ANANTAPUR

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INTRODUCTION

Field hockey places high demands on a player's aerobic and anaerobic energy systems (Boyle *et al.*, 1994), as the players cover a average distance of 8,000 – 10,000m during a match depending on the playing position (Konarski *et al.,* 2006). Increasing endurance capacity can led to several positive effects on field adaptations such as increased distance covered, intensity of play, number of sprints performed and number of ball involvements. Similarly, increasing parameters of strength and power can influence performance through increasing ability to sprint, jump, hitting, passing and pushing the ball during the game. These variables should be assessed at different time points across the season to evaluate training, monitor fitness and to provide details of any seasonal variation in fitness.

Statement of the Problem: The purpose of this study is to examine the changes on selected physical fitness and physiological profiles during two years of periodized training for RDT hockey academy players of different ages.

Selection of Subjects: To accomplish the purpose of the study, twenty (20) male hockey players were selected and segregated them into two groups based on their chronological age (10 to 12 years; N=9 and 14 to 16 years; N=11) as juniors and seniors. All the players in respective age categories from RDT Hockey Academy, Anantapur were selected as subjects.

Experimentation: Testing took place at four points during the periodized training year for two years (2009-10 & 2010-11); at the beginnings of general preparation (T1), specific preparation (T2), pre competitive phase (T3) and at the beginning of competitive phases of training (T4).

Results of the Study:

1. There is an existence of age-wise group difference irrespective of training years and different phases on abdominal muscular endurance, arm-shoulder muscular endurance, flexibility, maximum oxygen consumption and resting heart rate.
2. The sprinting speed, explosive power and arm-shoulder muscular endurance of both juniors and seniors improved significantly from phase to phase during the training years 2009-10 and 2010-11 as a result of systematic training.
3. The emphasis for development of speed during periodized hockey training is given in the fourth phase, for the explosive power in the third phase, and for arm-shoulder muscular endurance in the first phase.

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4. The improvement on sprinting speed, explosive power and arm-shoulder muscular endurance at each of the training phases of both junior and senior high schoolboys were distinctive between the periodized hockey training years.

Periodisation training is designed to help an athlete reach peak at the right time. It calls for varying the training stimuli (*i.e. training volume, intensity factors, and exercise*) over periods of time to allow for a proper progression in the exercise stress and planned periods of rest (Kraemer *et al*., 2007). The basic concept of periodisation is that variation in training is needed to optimise both performance and recovery.

Field hockey places high demands on a player's aerobic and anaerobic energy systems (Boyle *et al.*, 1994), as the players cover a average distance of 8,000 – 10,000m during a match depending on the playing position (Konarski *et al.,* 2006). Increasing endurance capacity can led to several positive effects on field adaptations such as increased distance covered, intensity of play, number of sprints performed and number of ball involvements. Similarly, increasing parameters of strength and power can influence performance through increasing ability to sprint, jump, hitting, passing and pushing the ball during the game. These variables should be assessed at different time points across the season to evaluate training, monitor fitness and to provide details of any seasonal variation in fitness.

In RDT hockey academy, training for successful competition has become virtually a year-round endeavour. To assist in better preparation, a competitor's year may be divided into phases such as preparatory, competitive and transition respectively. A number of studies have described the effects of seasons or periods of competition, training, detraining and reduced training on aspects of physical fitness. In this study a pioneering attempt made to evaluate changes on selected physical fitness and physiological variables of RDT hockey academy players of different ages.

Statement of the Problem:

The purpose of this study is to examine the changes on selected physical fitness and physiological profiles during two years of periodized training for RDT hockey academy players of different ages.

Delimitations:

1. Twenty (20) male hockey players were selected and segregated into two groups as juniors (10 to 12 years; N=9) and seniors (14 to 16 years; N=11) based on their chronological age. These players were selected as subject from RDT Hockey Academy, Anantapur, Andhra Pradesh, India.
2. The physical fitness and physiological profiles selected as criterion variables for the study were speed, agility, power, abdominal muscular endurance, arm-shoulder muscular endurance, flexibility, aerobic capacity and resting heart rate.
3. This study is delimited to testing at four points during the periodized training year; at the beginnings of general preparation (T1), at the beginning of specific preparation (T2), at the beginning of pre competitive phase (T3) and at the beginning of competitive phases of training (T4).

Limitations:

1. The heterogeneous character of the subjects in hereditary and environmental factors was considered as limitation.
2. The disparity prevailed in internal and external factors during testing periods could not be controlled.
3. The selected subjects played practice matches during evening hours daily which could not be measured which may be a limiting factor. So quantification of training is done during morning conditioning hours during two periodized training years.
4. In this study, there is no control group that can assess morphological growth and maturation so as to nullify the influence of these factors on the development of fitness, and it is considered as a limitation of the study.

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Hypotheses

1. It was hypothesized that significant difference on selected physical fitness and physiological profiles would exist between junior and senior academy players at different phases of training during two periodized years of systematic hockey training.
2. It was also hypothesized that there would be significant difference on the changes elicited for two periodized years of systematic hockey training on selected physical fitness and physiological profiles at each phase for both junior and senior academy hockey players.
3. Furthermore, it was hypothesized that there would be significant variation on selected physical fitness and physiological profiles from phase to phase during two periodized training years for both junior and senior academy hockey players.

Significance of the Study:

- To study the effect of a training program.
- To motivate the players to train more.
- To give players objective feedback.
- To make players more aware of the aims of the training.
- To evaluate whether a player is ready to compete.
- To determine the performance level of a player during a rehabilitation period.
- To plan short-and long-term training programs.
- To identify the weakness of a player.
- To determine if the recovery is sufficient.

Methodology - Selection of Subjects:

The study was proposed to investigate the changes on selected physical fitness and physiological profile during two years of systematic training program in RDT Hockey Academy Anantapur. To accomplish the purpose of the study, twenty (20) male hockey players were selected and segregated them into two groups based on their chronological age (10 to 12 years; N=9 and 14 to 16 years; N=11) as juniors and seniors. All the players in respective age categories from RDT Hockey Academy, Anantapur were selected as subjects. The selected subjects provided written, informed consent to participate in this study. All subjects were familiar with all the testing that took place.

Selection of Variables and Tests:

The criterion variables selected in this study were physical fitness and physiological variables and the tests.

List of Criterion Variables and Tests Used

Variables	Methods/Tests/ Equipment
Physical fitness variables	
1. Speed	30 m sprint
2. Agility	5,10,15 Shuttle run
3. Power	Standing broad jump
4. Abdominal muscular endurance	Sit ups
5. Arm-shoulder muscular endurance	Push ups
6. Flexibility	Bend and Reach
Physiological variables	
1. Aerobic capacity	2.4 kilometer run
2. Resting heart rate	Radial pulse

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Experimentation:

Testing took place at four points during the periodized training year for two years (2009-10 & 2010-11); at the beginnings of general preparation (T1), specific preparation (T2), pre competitive phase (T3) and at the beginning of competitive phases of training (T4).

A schematic representation of the periodized training year of the RDT Hockey Academy

Months during study was carried out	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan
Phases of Training	General preparation			Specific preparation			Pre Competition	Competition
Testing period	T1			T2			T3	T4

The study commenced after the end of the previous competitive season and at the beginning of the general preparation phase of training. The training year was divided into four mesocycles (*general preparation - June to August; specific preparation - September to November; precompetitive phase - December and Competitive phase - January*). The players were trained daily and thus it is possible to quantify exact training loads. All subjects were familiarized with the procedures prior to testing. Sport-specific fitness testing had been used frequently as part of the training programme. The subjects had been instructed to refrain from strenuous exercise for forty-eight hours prior to testing and to avoid food and caffeine intake for two hours preceding the assessments. All subjects completed testing at the same time of day to avoid any circadian rhythm effects (Atkinson & Reilly, 1996).

The selected subjects from RDT hockey academy, Ananthapur, were trained on both sessions (*i.e., morning and evening*). These subjects underwent different types of training during morning and game specific skill and played match during evening. The quantification of training is done during morning hours corresponding to the time the subjects' undergone training.

Statistical Techniques:

Descriptive statistics were calculated for all variables. Three-way Repeated Measures ANOVA with last two factor repeated design was utilized to determine significant changes on each variable with different phases of training. In which, the first factor denoted two age groups (*10 to 12 and 14 to 16 years*), the second factor referred to testing years (2009-10 *and 2010-11*), and the third factor indicated different phases of training [*T1, T2, T3 and T4 respectively*]. Whenever the '*F*' ratio for interaction was significant, simple effect was used as a follow up test. Then, the Scheffé S test was applied as post hoc test to determine the significant paired mean differences. The level of confidence was fixed at 0.05 to test the significance. The data was analysed using SPSS version 11.5.

Results of the Study:

1. There is an existence of age-wise group difference irrespective of training years and different phases on abdominal muscular endurance, arm-shoulder muscular endurance, flexibility, maximum oxygen consumption and resting heart rate.
2. The data on speed, agility, power, abdominal muscular endurance, arm-shoulder muscular endurance, flexibility, maximum oxygen consumption and resting heart rate of hockey players differs significantly between two years of systematic hockey training irrespective of age difference and different phases.
3. The data on speed, agility, power, abdominal muscular endurance, arm-shoulder muscular endurance, flexibility, maximum oxygen consumption and resting heart rate of hockey players fluctuates appreciably among different phases irrespective of age difference and training years.
4. The speed, explosive power and arm-shoulder muscular endurance of both age groups at different phases during two training years were found to be significant.

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5. The sprinting speed, explosive power and arm-shoulder muscular endurance of both juniors and seniors improved significantly from phase to phase during the training years 2009-10 and 2010-11 as a result of systematic training.
6. The improvement on sprinting speed, explosive power and arm-shoulder muscular endurance at each of the training phases of both junior and senior high schoolboys were distinctive between the periodized hockey training years.

Recommendations:

1. Studies may be conducted with such periodized hockey training to assess the efficacy of linear and undulated training load, and compare its effectiveness.
2. Studies may also be conducted to evaluate the effectiveness of training modalities at different training phases in seclusion for the peak performance at competitive phase.
3. Additional dependent variables should also be investigated to elucidate potential benefits of periodized hockey training in tests specific to hockey.
4. Since, competitive load and its stress upon players were difficult to quantify, further studies may be conducted with control groups in order to adjust the variances because of varying climatic conditions at different phases and competitive experiences in the development of fitness.
5. Periodized hockey training studies like this would require a larger number of players to participate than were available for this thesis. A larger sample of players would ensure a sufficient number of players completed the training and were available for testing, in light of the high subject mortality that could likely occur due to chronic and acute injuries sustained during routine hockey training. To recruit a larger sample of players with a less demanding schedule would likely require study participants of a lower standard than those participated in this study.
6. Since the majority of players train in year round programs and often compete in several leagues (*school, city, and representative programs*) at any given time, their opportunity for periodized programs is limited. It is important to recognise that there is little opportunity for players to improve fitness, even at the junior State level, so fundamental movement skills (*e.g. sprinting and jumping*) and fitness must be developed prior to this level in junior clubs and school physical education and sport programs. Once players reach senior and representative levels, coaches may place such a high emphasis on team and individual skills that little fitness develops in the limited amount of time allocated for physical conditioning in a periodized program.
7. For the purpose of multi-faceted development of fitness for sports performance and health, it is essential to undergo a periodized training protocol that caters to the demands of the team players, athletes and common man.
8. Based on the findings of the study and by reviewing the research literatures, the investigator is in the position to suggest that there is a need to evaluate the predominant characteristics of players of different levels of participation and achievement with hockey skill performance.

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EFFECT OF LOW, MEDIUM AND HIGH INTENSITY PLYOMETRIC TRAINING ON SELECTED PHYSIOLOGICALVARIABLES ON COLLEGE MEN STUDENTS

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INTRODUCTION

The science of sports training is a recent to the field of sports science. The sports science disciplines have improved at a very fast pace in the past few decades. The knowledge gained by these disciplines has to be understood by the coaches and trainers to apply it correctly to the training process. But majority of the coaches do not have sufficient scientific background and training to make full and effective use of the knowledge acquired by the sports science disciplines. This creates a gap between scientists and coaches. The science of training with its workers having sufficient background of science and sports are able to fill this gap and can become mediator between the scientists and the coaches.

According to Hardayal Singh (1991), Sports Training is a pedagogical process based on scientific principles, aiming at preparing sportsmen for higher performance in sports competition.

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).

Breath Holding Time

Breath holding time is defined as the duration of time through which one can hold his / her breath without inhaling and exhaling after a deep inhalation.

There are two types of breath hold time:

- ✓ Positive Breath holding time
- ✓ Negative Breath holding time

Endurance type of training will improve the breath holding time. Breath holding time also plays a vital role in the sports performance (P.J. Strukic, 1981).

STATEMENT OF THE PROBLEM

The purpose of this study was to find out the effect of low, medium and high intensity on plyometric training on selected physiological variables (**Breath holding time**)of college men students.

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LIMITATIONS

I. Heredity, which contributes to both physical and mental efficiency, will not be controlled.
II. Diet of the subject, general activity, motivation of the subjects is beyond the control of the researcher.
III. Practice sessions are not taken in to consideration.
IV. Academic pressure, like coaching class is not taken in to consideration.
V. Certain factors like food habits, life style, daily routine, climatic conditions and the environmental factors which may have an effect on this study were not taken into consideration while interpreting the results.

DELIMITATIONS

The study was delimited among college men students randomly selected from different colleges in Guntur, Andhra Pradesh.

This research confined among 80 college men students in the age group of 19 to 25 years.

The intensities of plyometric training selected were, low intensity, medium intensity and high intensity plyometric exercises.

This study was delimited to the following physiological variable.

Physiological Variables--: Breathing Hold Time

METHODOLOGY

The selection of subjects, selection of variables, orientation of subjects, reliability of instruments, competency of tester, reliability of data, test administration, experimental design and the statistical procedure used have been explained.

SELECTION OF SUBJECTS

To facilitate the study, 80 male students from the different colleges of Guntur, Andhra Pradesh were randomly selected as subjects and their age ranged between 19-25 years. The varied intensities selected for the study were, low intensity, medium intensity and high intensity. The subjects were divided into four groups namely low intensity Plyometric training group (LPTG), Medium intensity Plyometric training group (MPTG), High intensity Plyometric training (HPTG) and control group (CG), on random basis.

Before the commencement of the training, purpose of the study and method of performing varied intensities of Plyometric training exercises were explained to the subjects for their cooperation and to avoid injuries.

SELECTION OF VARIABLES

The researcher reviewed the various scientific literatures pertaining to varied intensities of Plyometric training on selected physiological, psychological variables **(Breath holding time)** from books, journals, and research papers. Taking into consideration, the feasibility and availability of instruments the following variables were selected.

DEPENDENT VARIABLES-: Physiological Variables

1. Breathing Hold Time
2. Independent variables

A. Low Intensity Plyometric Training (LPTG) for 12 weeks
B. Medium Intensity Plyometric Training (MPTG) for 12 2weeks
C. High Intensity Plyometric Training (HPTG) for 12 weeks

EXPERIMENTAL DESIGN

The study was formulated as a true random group design consisting of a pre-test and post test. The subjects (N=80) were randomly assigned to four equal groups of twenty male students. The groups were

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designed as experimental group-I – low intensity plyometric training group (LPTG), experimental group-II - medium intensity plyometric training group (MPTG), experimental group-III – high intensity plyometric training group (HPTG) and control group (CG) respectively. Pre-test was conducted for all the 80 subjects on selected physiological Veriable ,0such as **Breath holding time**,. The experimental groups (low, medium and high intensity plyometric training) participated in respective training for a period of twelve weeks. The control group did not participated in any of the training programme. The post-test was conducted on the above said dependent variables after an experimental period for all the four groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed test the hypothesis of the study.

Breath Holding Time

Breath holding time is defined 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).

RESULTS ON BREATH HOLDING TIME

The descriptive statistics comparing the initial and final means of physiological variable Breath Holding Time due to low intensity plyometrics, medium intensity plyometrics, high intensity plyometrics and control groups of college men students is presented in Table-I.

Descriptive Statistics on Low intensity plyometrics, Medium intensity plyometrics, High Intensity Plyometrics and Control Groups

Groups	Test	Mean	Standard Deviation	RANGE	
				Min.	Max.
Low intensity plyometrics	Initial	43.3	8.53	28.00	58.00
	Final	52.70	7.97	39.00	65.00
	Adjusted Mean	51.59			
Medium intensity plyometrics	Initial	42.8	8.19	0.00	57.00
	Final	50.90	8.80	36.00	65.00
	Adjusted Mean	50.26			
High Intensity Plyometrics	Initial	40.15	8.03	28.00	58.00
	Final	49.80	7.40	39.00	65.00
	Adjusted Mean	51.60			
Control Group	Initial	42.15	2.96	37.00	48.00
	Final	41.30	2.47	38.00	48.00
	Adjusted Mean	41.25			

Table I shows that pre-test mean on Breath Holding Time of low intensity plyometrics group was 43.3 with standard deviation ±8.53 pre-test mean of medium intensity plyometrics training group was 42.8 with standard deviation ±8.19. The pre-test mean of high intensity plyometrics group was 40.15 with standard deviation ±8.03, the pre-test mean of control group was 42.15 with standard deviation ±2.96.The descriptive statistics on post-test mean on Breath Holding Time of low intensity plyometrics group was 52.70 with standard deviation ±7.97

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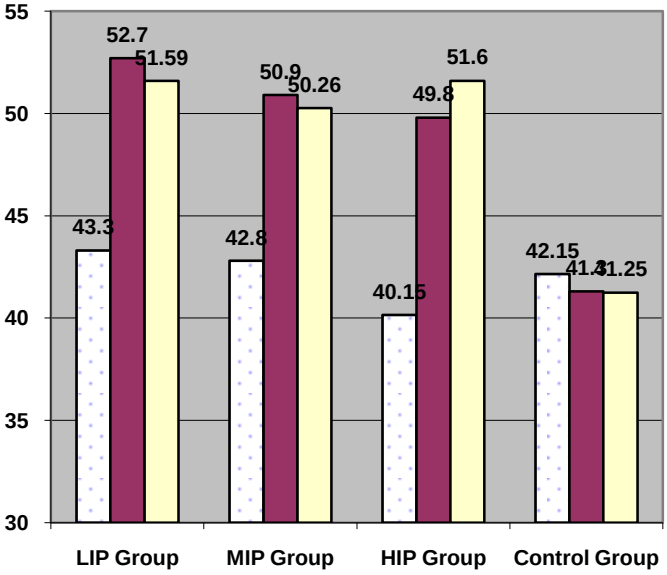
post-test mean of medium intensity plyometrics training group was 50.90 with standard deviation ±8.80. The post-test mean of high intensity plyometrics group was 49.80 with standard deviation ±8.80, the post-test mean of control group was 41.30 with standard deviation ±2.47.The adjusted mean on Breath Holding Time on low intensity plyometrics group was 51.59, medium intensity plyometrics training group was 50.26, high intensity plyometrics group was 51.60 and control group was 41.25, as shown in Table I. The obtained mean values on the experimental and control groups were presented in Figure-I.

BAR DIAGRAM SHOWING PRE, POST AND ADJUSTED MEANS ON BREATH HOLDING TIME



LIP: Low Intensity Plyometrics
MIP: Medium Intensity Plyometrics
HIP: High Intensity Plyometrics

The results on descriptive statistics proved that physiological variable Breath Holding Time was improved. And to test statistical significance of the differences, the obtained data on Breath Holding Time using ANCOVA was presented in Table II.

COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO LOW, MEDIUM AND HIGH INTENSITY PLYOMETRICS AND CONTROL GROUP ON BREATH HOLDING TIME

	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	Between	114.70	3	38.23	0.72
	Within	4050.5	76	53.3	
Post-Test Mean	Between	1536.15	3	512.05	10.15*
	Within	3833.40	76	50.44	
Adjusted Post-Test Mean	Between	1492.33	3	497.44	94.09*
	Within	396.51	75	5.29	

Required $F_{(0.05),\,(df\ 3,75)} = 2.77$

* Significant at 0.05 level of confidence

As shown in Table II, the obtained F-ratio of 0.72 on pre-test means of the groups was not significant at 0.05 level as the obtained F-value was less than the required table F-value of 2.77 to be significant at 0.05 level. This

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shows that there was no significant difference in means of the groups at initial stage.The results presented in Table II, the obtained F-ratio of 10.15 on post-test means of the groups was significant at 0.05 level as the obtained F-value was greater than the required table F-value of 2.77 to be significant at 0.05 level. This shows that there was significant difference in means of the groups at initial stage.Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and analysis of covariance was done. The obtained F-value on adjusted means was 94.09. The obtained F-value was greater than the required value of 2.77 and hence, it was accepted that there were significant differences among the adjusted means on the Breath Holding Time of the subjects.Since significant improvements were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table III.

Multiple Comparisons between Low Intensity, Medium intensity, High Intensity Plyometrics and Control Groups and Scheffe's Post Hoc

Analysis on Breath Holding Time

Low intensity plyometrics Group	**Medium intensity plyometrics Group**	**High Intensity Plyometrics Group**	**Control Group**	**Mean Diff.**	**C.I.**
51.59	50.26			1.34	2.08
51.59		51.60		0.01	2.08
51.59			41.25	10.34*	2.08
	50.26	51.60		1.34	2.08
	50.26		41.25	9.00*	2.08
		51.60	41.25	10.34*	2.08

***** Significant at 0.05 level.

The post-hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence, the required confidence interval was 2.08. The following paired mean comparisons were greater than the required confidence interval and were significant at 0.05 level.

Low intensity plyometrics *Vs.* Control Groups (MD: 10.34). Medium intensity plyometrics *Vs.* Control Groups (MD: 9.00).High Intensity plyometrics *Vs.* Control Groups (MD: 10.34).The following paired mean comparisons were less than the required confidence interval and were not significant at 0.05 level.Low intensity plyometrics *Vs*. Medium intensity plyometrics Groups (MD: 1.34) Low intensity plyometrics *Vs*. High Intensity Plyometrics Groups (MD: 0.01). Medium intensity plyometrics *Vs.* High Intensity Plyometrics Group (MD: -1.34).

DISCUSSIONS ON RESULTS

Discussion on the Results on Physiological Variables

Plyometrics is a common training methodology used by competitive athletes to develop speed and power. Jumping, bounding, skipping, throwing, or basically any recoil movement which ballistically stretches muscles are characteristic of plyometric drills and are characteristic of motions found in virtually every sport. The acquisition of a more rapid and forceful contraction is the fundamental basis for engaging in plyometrics training. As with most forms of exercises there are varying degrees of difficulty or intensity. And these intensities play vital role in modifying the effects on the players' physiological variables, such as, breath holding time,.

The results presented in Table- I proved there were mean differences due to low, medium and high intensity plyometric training among college men students on breath holding time. Table II proved that these differences were significant at 0.05 level as the obtained F-value on adjusted means was greater than the required table F-value to be significant. Table III proved those low, medium and high intensities of plyometric

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groups significantly better than control group. However, comparing between treatment groups, there were no significant differences.

Athletes devote a lot of time to the weight room during the off-season and pre-season for the purpose of developing a strength base. This has been recommended not only for the rigors of sport (Ebben, W.P. 1998), but also for safe engagement in plyometric drills. The ballistic nature of plyometric drills can be quite taxing on the musculoskeletal system. Muscles used during plyometrics are rapidly lengthened and shortened lending to another name for plyometric drills: stretch-shortening cycle (SSC) exercises (Wilson, G.J., Elliott, B.C. and Wood, G.A. 1991).

The findings of this study are in agreement with the theoretical foundations of the above studies, as it was found that different intensities of plyometric training has different effects on selected physiological variables of college men students.

DISCUSSIONS ON HYPOTHESES

1. It is hypothesised that there will be significant differences due to low, medium and intensity of plyometric training on selected physiological variables, breath-holding time among college men students.
2. It is hypothesised that comparing among the treatment groups, there will be significant differences on selected physiological variables among college men students.
3. The results on physiological variables, ,breath holding time, presented in Tables II proved that there was significant differences due to low, medium and high intensity. Plyometric training comparing to control group on breath holding time, as the obtained F-values were greater than the required table F-value to be significant at 0.05 level. The formulated hypothesis No. 1 that there will be significant differences due to low, medium and intensity of plyometric training on selected physiological variables, breath holding time, among college men students was accepted at 0.05 level.
4. The post-hoc analysis results on physiological variables, Tables 4.6, on breath holding time, proved that there was no significant differences among treatment groups on Breath holding time the formulated hypothesis that comparing among the treatment groups, there will be significant differences on selected physiological variables among college men students was rejected at 0.05 level. However, as for vital capacity, it was found that high intensity plyometric training was found to be better than low intensity plyometric training and the formulated hypothesis No. 3 was accepted at 0.05 level to this extent.

CONCLUSIONS

It was concluded that low, medium and high intensity plyometric training significantly altered physiological variables, breath holding time of the college men students. And it was also found there was no significant difference between treatment groups.

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EFFECT OF SWISS BALL TRAINING AND CORE BOARD TRAINING ON SELECTED PHYSIOLOGICAL VARIABLES (RESTING PULS RATE) OF BATSMEN OF CRICKET

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INTRODUCTION

Sports in the present world have become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and psychology etcetera. All the coaches, trainers, physical educational personals and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in International competitions.

SWISS BALL

Exercises are mostly designed with the part or the whole of the body to make physically fit. Different authors have made researches on all aspects of exercise training and their significance and effect on the physical fitness. Any specific conditioning for a particular activity will bring a definite change in physical fitness level and having this in mind, a new set of exercises called physioball exercises were developed especially to improve fitness (Author's Guide m 1999).

Benefits of Swiss ball

Training on its round, rolling surface challenges the body, because the swiss ball can be used in countless positions to increase strength, endurance, flexibility, balance and co-ordination through many ways. It is not possible with floor exercises or traditional gym equipment working out with the gymball in a revolutionary way to improve the fitness and health.

Use of Swiss Ball for General Fitness

Swiss ball are highly effective when used for general fitness and these exercises can either be done in the home or gymnasiums. For this, it does not have to lie on a hard floor, instead it gives training much more comfortably.

Although the researcher may work out regularly on the gym, they are generally only training the major mobilising muscles of the body. But our muscles work in pairs and for every mobilising muscle group there is an opposite stabilising group.

CORE TRAINING

Core training is a multi-dimensional training programme done on a unique, reactive surface to enhance human performance and functional strength. The term 'core training' can be confusing, some refer to core training as any training focused at the central (trunk) region of the body, which includes the abdominal, hips and back. Other refers to core training as the centralised or fundamental movement patterns from which all other movement patterns are derived.

THE BENEFITS OF CORE BOARD

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Core pilates is versatile, giving instructors and personal trainers a variety of formats to choose from including a one hour group class, a personal training session or circuit training.

Core pilates offers a large variety of movement options including twenty nine exercise and nine stretches, each with several levels of difficulty, making the benefits of the program accessible to participants all along the spectrum of conditioning and motor control.

IMPORTANCE OF PHYSIOLOGY

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 about 99 per cent of preparation and 1 per cent of performance, the 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 adoption to their particular activities.

Resting Pulse Rate

Pulse rate, which is the number of beats, felt exactly one minute. The average rate of the pulse in a healthy adult is 72 beats in each minute. There may be variation of upto five beats per minute within the normal range. The number of beats a pulse per minute or the number of beats of the heart.

The pulse rate or heart rate varies greatly among different people and in the same person under different situations. The American Heart Rate Association accepts as normal range from 50 to 100 beats per minute. The average rate is 72 beats per minute but the rate can accelerate to 220 per minute. The lesser pulse rate given good performance for all the sports and games.

OBJECTIVES OF THE STUDY

The athletes and coaches advocates different training and coaching methods to improve their speed, agility, flexibility, and other physiological variables, breath holding time, resting pulse rate and blood pressure. The objective of this study was to determine the effect of swiss ball and core board training on selected physical fitness and physiological variables among college men batsmen.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out the "Effect of swiss ball training and core board training on selected physiological variables **(Resting Pulse Rate**) of batsmen of cricket".

LIMITATIONS

This study was limited in the following respect and these limitations would be taken in consideration while interpreting the result.

1. The experiment was conducted on college level men batsmen in cricket.
2. Selection of subjects is between 19 to 25 years of age only.
3. There was no control over the diet, environment, etc., in this study.
4. Regular activities pertaining to their day-to-day affairs were not controlled.

DELIMITATION

To achieve the objectives of the study, the investigator delimited the following factors:

1. This study was conducted only on 60 college level men batsmen in cricket, who represented their college in inter-collegiate level tournaments.
2. Among different core board training only selected exercises were considered for this study.
3. Among the entire swiss ball exercises, selected swiss ball exercises were considered for this study.
4. The subjects were selected from different Colleges in Andhra Pradesh.
5. The following dependent and independent variables were selected for this study.

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Dependent Variables

Physiological Variables

Resting Pulse Rate

Independent Variables

1. Swiss Ball Training for twelve weeks
2. Core Board Training for twelve weeks.

METHODOLOGY

Research Methodology is a way to systematically solve the research problem. It may be understood as a science of solving how research is done systematically. This chapter describes the methodology and procedure adopted which precisely includes selection of the subjects, selection of variables, experimental design, pilot study, criterion measures, reliability of data, reliability of instruments, tester's reliability, subject reliability, swiss ball exercises, core board training, test administration, collection of data and the statistical techniques used.

SELECTION OF SUBJECTS

For the purposes of this study, sixty college level batsmen of cricket players were randomly selected from different college in Andhra Pradesh, who participated in inter-collegiate level tournaments. The subjects were randomly selected and their age group was between 19 to 25 years. The subjects expressed their willingness to participate in the study.

RESEARCH DESIGN

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

The purpose of this study was to find out the effect of swiss ball training and core board training on selected physiological variables(**Resting Pulse Rate)**of college level batsman of cricket. In this research design randomly selected sixty college level batsmen (N=30) were divided into three equal groups consisting of twenty players in each group. They were measured of the selected variables, which formed initial scores of the subjects. After the experimental treatment, namely, swiss ball training for experimental group-I and core board training for experimental group-II, post-test scores were collected on selected variables. Control group was not given any specific treatment. The initial and final means were compared to test significance through Analysis of Covariance (ANCOVA). In all cases 0.05 level was fixed to test the hypothesis of this study.

RESULTS ON RESTING PULSE RATE

The statistical analysis comparing the initial and final means of Resting Pulse Rate due to Swiss ball Training and Core board Training among batsmen of cricket is presented in Table-I

COMPUTATION OF ANALYSIS OF COVARIANCE OF RESTING PULSE RATE

	Swiss Ball Training	Core Board Training	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre-test Mean	62.70	58.60	62.25	Between	202.23	2	101.12	2.30
				Within	2506.75	57	43.98	
Post-test Mean	59.75	56.45	62.75	Between	397.20	2	198.60	6.39*
				Within	1772.45	57	31.10	
Adjusted Post-test Mean	59.22	57.36	62.38	Between	247.81	2	123.90	4.74*
				Within	1464.68	56	26.16	
Mean Diff	-2.95	-2.15	0.50					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant at 0.05 level

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As shown in Table I, the obtained pre-test means on Resting Pulse Rate on Swiss ball Training group was 62.70, Core board Training group was 58.60 was and control group was 62.25. The obtained pre-test F-value was 2.30 and the required table F-value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on Resting Pulse Rate on Swiss ball Training group was 59.75, Core board Training group was 56.45 was and control group was 62.75. The obtained post-test F-value was 6.39 and the required table F-value was 3.16, which proved that there was significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F-value 4.74 was greater than the required value of 3.16 and hence, it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table-II.

Scheffe's Confidence Interval Test Scores on Resting Pulse Rate

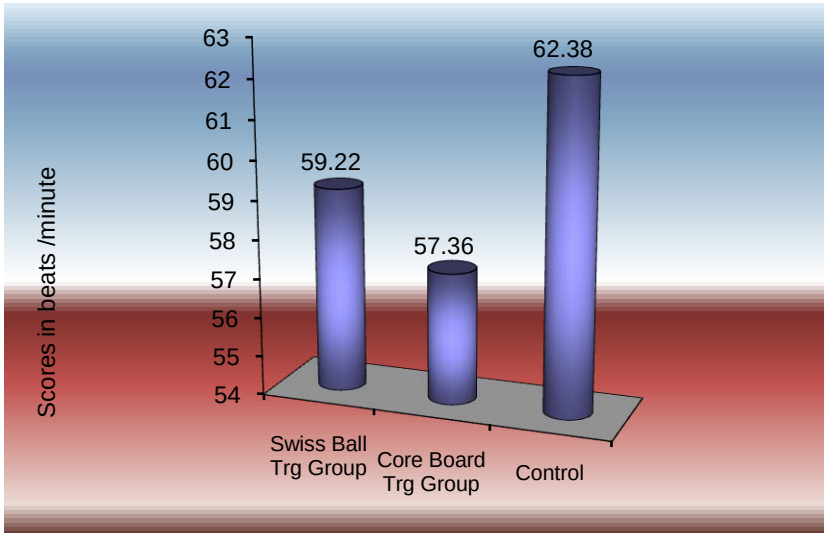
MEANS				Required C.I.
Swiss ball Training Group	Core board Training Group	Control Group	Mean Difference	
59.22	57.36		1.86	4.07
59.22		62.38	3.16	4.07
	57.36	62.38	5.02*	4.07

***** Significant at 0.05 level

The post-hoc analysis of obtained ordered adjusted means proved that there was no significant differences existed between Swiss ball Training group and control group (MD: 3.16). There was significant difference between Core board Training group and control group (MD: 5.02). There was no significant difference between treatment groups, namely, Swiss ball Training group and Core board Training group (MD: 1.86).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure-I.

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON RESTING PULSE RATE



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DISCUSSIONS ON FINDINGS ON RESTING PULSE RATE

The effect of Swiss ball Training and Core board Training on Resting Pulse Rate is presented in Table-I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 4.74 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table-II. Its proved that there was no significant difference between Swiss ball Training group and control group (MD: -3.16) and there was significant difference between Core board Training group and control group (MD: 5.02). Comparing between the treatment groups, it was found that there was no significant difference between Swiss ball Training and Core board Training group among batsmen of cricket. Thus, it was found that core board Training was significantly better than control group in reducing beats per minute and thereby stabilising Resting Pulse Rate of the batsmen of cricket.

DISCUSSIONS ON HYPOTHESIS

1. Swiss ball training and Core Board Training would improve selected physiological variables resting pulse rate, among batsmen of cricket players compared to control group.
2. There would be significant differences between swiss ball training and core board training in altering selected physiological variables among batsmen of cricket.

The results presented in Tables X, on physiological variables, resting pulse rate,. It showed that there were significant differences on adjusted means due to swiss ball and core board training as the obtained F-values 4.74, Was greater than the required F-value of 3.16 to be significant at 0.05 level. Since significant results were obtained, the results were further subjected to post-hoc analysis and the results presented in Tables XI, on physiological variables. Resting pulse rate, respectively proved that swiss ball training and core board training significantly improved physiological variables, Thus to this extent the formulated hypothesis that there would be significant difference due to swiss ball and core board training on physiological variables, breath holding time and diastolic blood pressure was rejected at 0.05 level.

Kim, J.J. (2015) compared the effects of Swiss ball exercise and resistance exercise on the respiratory function and trunk control ability and found effective for improving the respiratory function and trunk control ability.

The post-hoc results presented on selected physiological variables further proved that comparing between treatment groups, swiss ball training was significantly found to be better than core board training. The formulated hypothesis No. 3 that there would be significant differences between swiss ball training and core board training on selected physiological variables was accepted at 0.05 level . As for the remaining variables, namely, , resting pulse rate, there was no significant differences between swiss ball training and core board training and to this extent the formulated hypothesis was rejected at 0.05 level.

CONCLUSIONS

It was concluded that swiss ball training and core board training significantly improved physiological variable, such as, resting pulse rate comparing to control group. Comparing between treatment groups, it was found that there was no significant difference between swiss ball training and core board training in altering resting pulse rate among batsmen of cricket.

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THE RELATIONSHIP BETWEEN JOB SATISFACTION AND JOB STRESS OF PHYSICAL EDUCATION TEACHERS WORKING IN HIGH SCHOOL'S OF VISAKHAPATNAM DISTRICT

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ABSTRACT

This paper aims to find out the relationship between Job Satisfaction and Job Stress of Physical Education Teachers working in High School's of Visakhapatnam District. based on their gender, age, marital status, service, management, type of education and locality. Various Indian and foreign studies were reviewed. Descriptive Survey method has been used in this study. The sample consisted of 50 Physical Education Teachers from Government, Private and Local body High School's of Visakhapatnam District. using stratified random sampling method. Standardized tools were adopted for the study are Job Satisfaction Scale of B.C. Muthaiah and Job Stress Scale of T.R. Polival were used for the physical Education teachers to find out the opinions on Job Satisfaction and Job Stress of Physical Education Teachers working in Visakhapatnam District. The data were analyzed using various statistical methods like correlation, t-test and ANOVA by SPSS package. The results indicated that there is a positive relationship between Job Satisfaction and Job Stress of Physical Education Teachers working in High School's of visakhapatnam District. The results show there is a significant relationship between Job Satisfaction and job Stress and the Physical Education Teachers showed more job satisfaction and high Job stress in the High School's of Visakhapatnam District.

INTRODUCTION

Physical Education is an integral part of total education process in a field of endeavour which has its aim, the development of physically, mentally, emotionally, and socially fit citizen, through the medium of physical activities which has been selected with a view to realize this outcome- Charles A.Bucher (1979.). In its broadest perspective physical education covers play, exercise, recreation and sport and is characterized by a general programme of motor activity, skill, free play and exercise assuring strength, health, fitness and well being within and even outside education. Teaching is considered as an occupation with good job security and teachers are well paid for their services. The greatest positive aspect of teaching is the personal satisfaction it provides because it carries a degree of personal involvement in the success of students. Today, Physical Education teachers are playing a very vital role and their work can be divided into five different categories of duties namely, planning, teaching, evaluative, administrative and various unclassified ones. Physical Education teachers feel their workload heavier, strenuous and difficult too. They face a lot of problems due to longer working hours, inadequate facilities/materials, clerical work and non congenial working conditions. In proportion to the expectations of the society, the Physical Education teachers are not given due place and recognition. This leads to stresses and dissatisfaction. The extent of job stress, however, depends largely upon background experiences, temperament and environmental conditions. Some of the physical education teachers feel that they have a heavy workload, less recognition from society, lack of co-operation, little opportunities for growth and advancement and so on. Those who are not satisfied with their jobs have high stress level and are less adjusted in comparison to those who have job satisfaction.

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JOB SATISFACTION:

The term Job satisfaction devotes the extent to which an individual needs and expectations are satisfied and the extent to which the individual perceives that satisfaction as stemming from his total job situation.

JOB STRESS:

Job stress refers to the work load undertaken by a teacher of Physical Education as a part of his duties in an Educational Institution. Stress is defined as the anticipation inability to respond adequately to perceived demands accompanied by anticipation of negative consequences for inadequate responses.

METHODOLOGY: The purpose of the study was to investigate the relationship of teachers job satisfaction and job stress of physical education teachers working in High School's of Visakhapatnam District. The present investigation was an attempt to determine the Job Satisfaction and Job Stress of Physical Education Teachers working in High School's of Visakhapatnam District. Various Indian and foreign studies were reviewed. Descriptive Survey method has been used in this study. The sample consisted of 50 Physical Education Teachers from Government, Private and Local body High School's of Visakhapatnam District. using stratified random sampling method. Standardized tools were adopted for the study are Job Satisfaction Scale of B.C. Muthaiah and Job Stress Scale of T.R. Polival were used for the physical Education teachers to find out the opinions on Job Satisfaction and Job Stress of Physical Education Teachers. The data were analyzed using various statistical methods like correlation, t-test and ANOVA by SPSS package. The score obtained by different groups are compared across the variables like gender, age, marital status, service, management type of education and locality with respect of Physical Education Teachers. The results indicated that there is a positive correlation between Job Satisfaction and their Job Stress of Physical Education Teachers. The results show there is a significant relationship between Job Satisfaction and job Stress and the Physical Education Teachers showed average job satisfaction and high Job stress in the High School's of Visakhapatnam District.

OBJECTIVES OF THE STUDY:

The objectives of the study are :-

1. To find out the level of job satisfaction and job stress among physical education teachers working in different managements, High School's of Visakhapatnam District..
2. To examine the inter-relationship between the Job Satisfaction and Job Stress of physical education teachers working in different managements, High School's of Visakhapatnam District..
3. To find out the contributing causes of dissatisfaction among teachers so that appropriate measures can be taken-up by educational authority to minimize such causes.
4. To study the effect of type of the school on job satisfaction and job stress of Physical Education Teachers working in high school's of Visakhapatnam District.
5. To find out the level of degree of job satisfaction and job stress among the teachers on the basis of their age, sex, marital status, service, management, type of education and locality.

HYPOTHESIS OF THE STUDY

1. There will be no significant relationship between Job Satisfaction and Job Stress of physical educations teachers working High School's of Visakhapatnam District..
2. There will be no significant difference between physical education teachers based on their socio-economic variables towards their Job Satisfaction and Job Stress in High school's of Visakhapatnam District.

SIGNIFICANCE OF THE STUDY:-

The result of present study may be significant in the following ways: 1) This study might help to find out the degree of job satisfaction and job stress of teachers working in different management High School's of Visakhapatnam District., 2)This study provides immense benefit for the administrators so as to understand

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conditions causing job stress to physical education teachers in order to ensure job satisfaction, 3) It might also help to indicate contributory causes of dissatisfaction among teachers so that appropriate measures can be taken by Educational authority to minimize such causes 4) It may help to find the effect of size of the high school's on job satisfaction and job stress of high school's physical education teachers and 5) It will help to find out the degree of job satisfaction and job stress among the High school physical education teachers on the basis of their age, sex and job experience.

Table 1: Overall response of Physical Education Teachers towards their Job Satisfaction and Job Stress in High School's of visakhapatnam District

	N	Min. Score	Max.	Mean	Mean Percent	Std. Dev.
Job Satisfaction	50	50	150	109.52	73.01	7.71
Job Stress	50	30	60	46.52	77.53	3.66

Table 1. observed that, the Physical Education teachers showed positive response with respect to their Job Satisfaction and average response towards their Job Stress in High School's of Visakhapatnam District. The mean and mean percentages are found to be 114.50 and 15.96 which are 76.33 %and 53.20% respectively.

N	**'r' – value**	**p-value**
50	0.34*	0.01

*Significant at 0.05 level

There is a significant relationship between Job Satisfaction and Job Stress of Physical Education Teachers working in High School's of Visakhapatnam District.. The 'r' – value is found to be 0.324 and the p-value is 0.02 which is significant at 0.05 level.

Table 3: Significant difference between Physical Education Teachers perceptions based on their socio-economic variables towards their Job Satisfaction and Job Stress of Physical Education Teachers in High School's of Visakhapatnam District.

Variable	**Category**	**Job Satisfaction**					**Job Stress**			
		N	**Mean**	**Std. Dev.**	**t-value**	**p-value**	**Mean**	**Std. Dev.**	**t-value**	**p-value**
Sex	Male	42	109.60	7.88	0.16^{NS}	0.88	76.52	3.93	0.02^{NS}	0.99
	Female	8	109.13	7.20			76.50	1.77		
Age	Below 40 Years	22	110.59	7.51	0.87^{NS}	0.39	76.55	4.11	0.04^{NS}	0.97
	Above 40 Years	28	108.68	7.89			76.50	3.34		
Marital Status	Married	44	108.95	7.55	1.42^{NS}	0.16	76.55	3.73	0.13^{NS}	0.90
	Unmarried	6	113.67	8.26			76.33	3.44		
Service	Below 20 Years	21	109.48	6.18	0.03^{NS}	0.97	75.81	3.06	1.17^{NS}	0.25
	Above 20 Years	29	109.55	8.76			77.03	4.01		
Salary	Pay Scale	33	115.91	6.41	3.35**	0.00	79.52	2.91	2.08*	0.04
	Consolidated Pay	17	109.82	5.40			77.59	3.47		
Management	Government	18	107.78	7.32	2.43*	0.04	76.39	3.26	4.84*	0.01
	Aided	15	108.13	6.37			74.53	3.02		
	Un-aided	4	107.50	8.50			75.75	1.50		
	Local body	13	114.15	8.35			79.23	3.92		
Type of	Boys	2	101.00	2.83	2.23^{NS}	0.12	71.50	2.12	2.34^{NS}	0.11

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Education	Girls	8	106.63	4.00			75.88	2.80		
	Co-Education	40	110.53	8.07			76.90	3.71		
Locality	Rural	18	106.61	5.77	2.07*	0.04	75.61	4.17	1.33 NS	0.19
	Urban	32	111.16	8.24			77.03	3.30		

**Significant at 0.01, *Significant at 0.05 level and NS: Not Significant

Results and Discussions:

Physical Education teachers showed positive response with respect to their Job Satisfaction and average response towards their Job Stress in High School's of Visakhapatnam District. There is a high significant relationship between Job Satisfaction and Job Stress of Physical Education Teachers working in High School's of Visakhapatnam District.

There is a significant difference between Pay Scale and Consolidated Pay physical education teachers perceptions and Physical education teachers who are drawing Pay Scales expressed high perceptions than that of Physical education teachers who are drawing Consolidated Pay with respect to their Job Satisfaction in High School's of Visakhapatnam District. There is a significant difference between Government, Aided, Un-aided and Local body Physical Education teachers perceptions and Physical Education teachers working in Local body High School's expressed high perceptions than that of Government, Aided and Un-adied High school Physical education Teachers with respect to their Job Satisfaction in High School's of Visakhapatnam District. There is a significant difference between rural and urban area Physical Education teachers perceptions and Urban area Physical education teachers expressed high perceptions than that of rural area Physical education teachers with respect to their Job Satisfaction in High School's of Visakhapatnam District.

There is a significant difference between Pay Scale and Consolidated Pay physical education teachers perceptions and Physical education teachers who are drawing Pay Scales expressed high perceptions than that of Physical education teachers who are drawing Consolidated Pay with respect to their Job Stress in High School's of Visakhapatnam District. There is a significant difference between Government, Aided, Un-aided and Local body Physical Education teachers perceptions and Physical Education teachers working in Local body high school's expressed high perceptions than that of Government, Aided and Un-adied High school Physical education Teachers with respect to their Job Stress in High School's of Visakhapatnam District.

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SCIENTIFIC SPORTS TRAINING

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1. INTRODUCTION

Over the past 45 years or so, we have achieved significant scientific understanding of many physical factors involved in the development of various aspects of training, including specific strength and conditioning training. This has allowed more effective programs to be used for athletes' safety and preparation for competitions. Specifically, several components of training, such as skills, speed, strength, stamina and psychological skill training have been a focus of numerous text and research. The current conceptualization of science of training, basic principles of training theories as well as specific safe methods of strength and conditioning for athletes, have been summarized in Science and Practice of Strength Training. The major theme of this presentation aims to provide scientific basis for the concept of adaptation as a law of training. Indeed, proper exercise, sport-specific drills and/or regular physical and psychological load is a very powerful stimulus for adaptation. Accordingly, the major objective of athletes' preparation should be inducing specific adaptations in order to improve sport performance via: (a) carefully planned ;(b) skillfully executed; and (c) goal-oriented training programs. From practical perspectives, at least four important features of the adaptation process should be considered by a coach in order to make training programs effective and most importantly safe for the athletes. Otherwise, athletes may experience and express various forms of maladaptive responses to training and associated performance saturation/deterioration with high risk for sport-related traumatic injuries. Athletes' adaptive responses are usually characterized by an increase in both physical properties, such as strength, speed, etc., and associated psychological indices, including emotional stability, proper level of motivation and vigor. According to Zatsiorsky (1995) there are four essential features of adaptation process as outlined below:

1. Overload:

The most challenging issue that coaches face daily is to provide an opportunity for maximal performance enhancement and secure a safe and injury free coaching environment. There is always a possibility of injury due to the nature of athletic activity that coaches should constantly be aware of. Due to coaches' primary responsibilities, which are an achievement of maximal performance and secure winning, positive (but not negative) training effect should be their major goal. However, positive training effect may take place only if training load is above the habitual level. In other words, if training load in terms of the volume and intensity is the same over an extensive period of time, there will be no additional adaptation resulted in physical fitness saturation. If the training load and intensity are too low, detraining may occur, meaning that an athlete may not improve his/her physical status despite continuous training. On the other hand, if the training load and intensity are too high, an athlete may experience maladaptive responses to training and an increase in risk of injury. Athletes' individual responses (both adaptive and maladaptive) should be carefully monitored by the coaches in order to achieve progressive improvement and most importantly, to prevent overload-related injuries. Specific signs and symptoms of athletes' overtraining will be discussed elsewhere in this book. Overall, training load can be roughly classified according to three important principles: (a) progressive stimulating :when the training

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volume and intensity are above individually defined neutral zone allowing for adaptation to occur; (b) retaining: when the magnitude of the load remains the same in the individually defined neutral zone, so the level of fitness may maintain for a long time; (c) detraining: when the magnitude of the load tends to decrease and associated performance deterioration an and/or functional capacities of the athlete may be observed. It should be noted however, that the aforementioned principles should be considered with regards to hierarchy and duration of the periodical training units (i.e., general preparation period, competitive preparation period and transition period). In addition, it is important to note that these principles are also athletic fitness/skill level dependent. The aspect of individualization in terms of novice versus elite athletes' responses to training load will be discussed in more details in the following text.

2. Accommodation:

Positive training effect and associated positive psychological responses to the training load may take place if accommodation is prevented via proper training programs. In essence, accommodation refers to the training program when the same training program and type of exercise remains constant over a prolong period of time. For example, a diver that just performed optional dives (regardless of degree of difficulty) and ignores fundamental dry land, gym and conditioning training, a decrease in performance level will ultimately be observed. This is kind of a manifestation of biological law of accommodation. According to this law, an organisms' response to a given constant stimulus saturate or even decrease over time. Not surprisingly, experienced coaches always vary their exercise programs by (a) constantly replacing exercise routine; (b) switching room aerobic to anaerobic types of activity; and (c) balancing specificity and generalization of training sessions. It is also advisable for coaches to schedule flexibility and relaxation exercises between heavy resistance strength drills to speed up recovery, prevent loss of flexibility and overall to avoid accommodation. According to Zatsiorsky (1995), training programs should satisfy at least two demands to avoid accommodation and to preserve specificity via: (a) quantitative modification (changing training loads in terms of the volume and intensity of exercise); and qualitative modification (replacing the exercises aimed at developing the athletes' specific functions such as strength, coordination/flexibility, and endurance).

3 Specificity:

Training adaptation is highly specific in nature. Success and injury free in particular sports require that the athletes posses specific qualities. What would be essential for a long distant runner could be detrimental or even harmful for a long jumper? Well developed upper body for a gymnast may not be beneficial for a springboard diver. Even among divers, depending on the event (springboard versus platform diver) current practices tend to provide differential training in order to develop sport diving specific qualities. As an illustration, excessive muscular development of the lower body compared to the upper body in springboard divers is an obvious necessity that needs to be achieved via specific strength training (see also Current trend in diving is to achieve excessive body mass and explosive power of the lower body allowing the improvement of the jumping skill and height of the dives. As can be seen from this picture, top world springboard divers (right Pictures) are "more developed" and have larger leg muscles compared to the platform divers (left Pictures). Both males and females are most likely to encounter differential and special training programs, even within the same sport of diving. [Pictures were taken during FINA 2007 Diving World Series, Nan Jing, China, with permission from divers]. Another way to consider specificity of training program is to select sport-demand-specific routines. Clearly, fish can swim because they swim, birds can fly because they fly, frogs can jump because they jump, divers can dive because they dive, and so on. Thus, strength, flexibility and endurance training are highly specific in various sports. Unfortunately, this important principle of specificity of training programs is often ignored by the coaches. For example, it is a common practice in collegiate athletics that divers and swimmers utilize similar heavy resistance workouts for upper body, particularly during preparation period. This is inconsistent, at least, with the

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principle of specificity. Coaches should be aware that "what is honey for a swimmer could be poison for a diver". Similarly, in the field of athletic training dealing with injured athletes, at an early stage following acute injury, it is important to control inflammation and regain the pre-injury range of motion. Accordingly, a specific exercise rehabilitation program should be utilized for this purpose to reduce probability of slow recovery and/or risk for re-injury. At the later stage of acute injury recovery, the muscle strength should be a major target for rehabilitation, thus, specific strength training drills must be utilized at this stage of recovery. Finally, preparation for the execution of specific drills should be a focus of rehabilitation. Accordingly, more sport-specific rather than general conditioning, strength and flexibility exercise should be incorporated into rehabilitation sessions. Another aspect of specificity may be considered from irrespective of identical-elements theory (see also theories of transfer initially developed by Thorndike back in 1914 and further elaborated within the scope of current motor control and learning research). In essence, in order to achieve positive transfer of learning between various skills and exercise routines, the main elements underlying different skills or situations surrounding performance must be identical and similar in nature. In other words, a major assumption of this theory is that positive transfer between skills is not based upon any general and unrelated performance, but rather very specific in nature. Similarities between stimuli (type of exercise) and responses (developed skills) are complementary in nature. The use of dry-land and gymnastic training aimed at practicing complex exercise maneuvers complement (positively transfer) to the springboard diving. Conversely, as the degree of similarity between stimuli and responses are declined, conflicting consequences may be experienced. For example, because of the dissimilarity between diving and gymnastic somersaulting techniques, athletes' transition from gymnastic to diving may not likely foster any positive transfer. Similarly, because of the dissimilarity between the two sports, tackle techniques in football may not be applicable (but rather difficult to transfer) for rugby. In fact, a vast majority of concussive injury in rugby is due to tackle techniques that the rugby players adopted from their past experience playing football. Coaches, who understand basic principles of specificity, may avoid numerous problems and most importantly, may provide an optimal injury free training environment for their athletes.

4) Individualization.

Due to genetically predisposed and environmentally influenced individual differences among people, the same exercise routines and training program may elicit differential effect among athletes. Indeed, people are different in terms of anthropometric dimensions (larger/smaller; stronger/weaker; more or less flexible; more or less fatigable; emotionally stable/unstable; risk taker/risk avoider; etc.). Therefore, any attempts to mimic performance style and or techniques of world best athletes have proven to be useless or even harmful. For example, numerous attempts to "copy" Greg Louganis' diving style by novice divers led to significant deterioration of their own styles and overall performance. Similarly, mimicking the best Chinese divers' clean entry and/or fast somersaulting techniques (which was a tendency a few years ago among USA diving coaches), has proven to be devastating. However, the acquisition of fundamental skills and coordination patterns should be essential regardless of aforementioned individual differences among athletes. Fundamentally correct posture and basic skills should be trained regardless of sports, whether it be complex coordination, games and/or cyclic in nature. Not surprisingly, apparatus gymnastics is called the "mother of all sports" and required as an essential training method for youngsters. With coaches' creativity based on solid fundamental skills and qualities, injury controlled training methods proved to be successful. No average methods exist for exceptional athletes. "Only average athletes, those who are far from excellent, prepare with average methods. A champion is not average but exceptional"

It should be noted that there is a current tendency to reconsider the major assumption of the training

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periodization , due to various practical reasons, such as:

- Increased number and level of competition throughout the entire season;
- Increased complexity of routines, especially in complex coordination sports;
- Earlier maturation of athletes, requiring to consider developmental aspect of athletes preparation;
- Increased total volume and intensity of training load the whole year around; current practices and attempts to simultaneously develop motor abilities and functions such as strength, flexibility and stamina;
- Increased number of alternative views on the nature of training periodi-zation;
- progress in training methods and sport technologies, and protective devices, such as helmets, mouth guards, pads, braces, etc
- Increase in the financial and other extrinsic sources for motivation to compete constantly at their peak level.

CONCLUSION

There is always a trade-off between high-achievement and probability of overtraining as well as high risk of injury among elite athletes. Proper planning, specificity and individualization of the training program are key factors to consider. There are tendencies in modern sports to (a) standardize the training program within certain sports; and (b) modify the exercise content to achieve maximal adaptation and reduce the probability of accommodation. This provides prerequisites for a current training control and improvement of sport specific training technology. The negative aspect is that the possibility of excessive accommodation when the athletes' response to a continuing stimulus decreases followed by a decrease in the training effect as well. This may force the coaches to reconsider the initial training routine with emphasis on an increased training load and ultimately putting athletes at high risk for overtraining and injury. The second tendency relates to the effect of novelty when the unaccustomed exercises induce more pronounced adaptive responses. However, there is still a problem as to how to increase the effect of stimulus novelty when an athlete is accustomed to repetitive sport-specific exercises. Indeed, additional research, enhanced coaches' experience and quality observations are necessary to overcome existing controversies in training programs aimed at maximizing performance enhancement without jeopardizing the safety and well-being of athletes. Personal consultations with these prominent leaders in the field of athletes training are
highly appreciated.

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A PSYCHOLOGICAL ANALYSIS OF MENTAL PREPAREDNESS AND GAME WINNING BEHAVIOR AMONG THE INTER-UNIVERSITY LEVEL WOMEN VOLLEYBALL PLAYERS

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The purpose of the research was to contemplate the significance of the psychological variables in mental preparedness and game winning behavior among the inter-university level women volleyball players by assessing the psychological variables namely anxiety, achievement motivation and self–confidence. This research was carried out among 20 setters, 20 attackers and 20 blockers, total subjects of sixty women inter university volley ball players from south and west zones randomly by employing the psychological assessment tests namely sports competition anxiety test for measuring anxiety was used. The statement psychological questionnaire was used for measuring self-confidence in subjects and the standard psychological tool was used to measure achievement motivation. The findings on the psychological variables from the obtained results proved that Setters had more anxiety, followed by attackers and then by blockers and the differences were significant. Thus, the attackers and blockers were significantly better than setters in variable anxiety. In case of self–confidence blockers scored first followed by attackers, however there were no significances between blockers and attackers. Further there was significant differences existed between attackers & setters & blockers in self-confidence. In case of psychological variable achievement motivation, attackers scored first followed by blockers. However, this difference had no significance. Thus, the attackers and blockers were significantly better than setters.

Psychological variables selected for this study: Among the many psychological variables, the investigator has selected variables such as:

1. Anxiety [SCAT by Martens]
2. Self confidence[Agnihotri]
3. Achievement motivation[Kamlesh]

Statistical Analysis

The data collected from the different university players were compared for the differences. The difference obtained in the selected psychological variables was tested through statistical treatment Statistical technique Analysis of Variance (ANOVA) was employed to test the differences from one group of players to another group of players

Table – I: Showing the analysis of Variance on the Means of the Psychological Variable - Anxiety- obtained from Setters Attackers and Blockers of the Inter University, Women Volleyball Players

	Inter University Women Volleyball Players-Means			Source of Variance	Sum of squares	df	Mean squares	F
Mean	18.30	20.10	22.65	Between	191.10	2	95.55	30.17*
				Within	180.55	57	3.17	

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Table-II: Showing Means, Mean differences and the Required Value of Scheffe's Confidence Interval in Anxiety (Scores in numbers)

Inter University Women Volleyball Players			Mean Difference	C.I
Blockers	Attackers	Setters		
18.30	20.10		1.80*	1.41
18.30		22.65	4.35*	1..41
	20.10	22.65	2.55*	1.41

Table – III: Showing the analysis of Variance on the Means of the Psychological Variable – Achievement Motivation - obtained from Setters Attackers and Blockers of the Inter University Women Volleyball Players

	Inter University Women Volleyball Players-Means			Source of Variance	Sum of squares	df	Mean squares	F
Mean	16.30	16.85	13.90	Between	96.10	2	48.05	19.08*
				Within	143.55	57	2.52	

Table - IV: Showing Means, Mean differences and the Required Value of Scheffe's Confidence Interval in Achievement Motivation (Scores in numbers)

Inter University Women Volleyball Players			Mean Difference	C.I
Blockers	Attackers	Setters		
16.20	16.85		-0.65	1.26
16.20		13.90	2.30*	1.26
	16.85	13.90	2.95*	1.26

Table – V: Showing the analysis of Variance on the Means of the Psychological Variable – Self Confidence- obtained from Setters Attackers and Blockers of the Inter University Women Volleyball Players

	Inter University Women Volleyball Players-Means			Source of Variance	Sum of squares	df	Mean squares	F
Mean	34.65	33.10	23.05	Between	1586.43	2	793.22	153.11*
				Within	295.30	57	5.18	

Table - VI Showing Means, Mean differences and the Required Value of Scheffe's Confidence Interval in Self Confidence (Scores in numbers)

Inter University Women Volleyball Players			Mean Difference	C.I
Blockers	Attackers	Setters		
34.65	33.10		1.55	1.81
34.65		23.05	11.60*	1.81
	33.10	23.05	10.05*	1.81

Conclusion

1 It was concluded that setters had significantly more anxiety, followed by attackers, and then blockers. Thus they were significant differences between the players in anxiety

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2 It was concluded that attackers scored high in achievement motivation followed by blockers and then by setters. There was more significant difference between the blockers and attackers. However, significant differences were noted among setters and attackers and setters and blockers

3 It was concluded that blockers possess high level of self confidence followed by attackers and setters. There was significant difference between setters and attacker and setters and blockers in self confidence

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EFFECT OF YOGA PRACTICES VS PHYSICAL EXERCISES ON BIO-CHEMICAL VARIABLES AMONG COLLEGE MEN STUDENTS

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"Yoga, an ancient but perfect science, deals with the evolution of humanity. This evolution includes all aspects of one's being, from bodily health to self realization. Yoga means union - the union of body with consciousness and consciousness with the soul. Yoga cultivates the ways of maintaining a balanced attitude in day to day life and endows skill in the performance of one's actions." B.K.S. Iyengar

INTRADUCTION

In this modern age of advanced technology the level of facilities available for our convenience has increased. But it also leads to an increase in our problems related to health, life and emotions. Now a day's human life is more stressful and problem nature. Many people suffer from phobias and neuroses as a result of the stresses and interactions of everyday living. Yoga is the science of right living and is intended to be incorporated in daily life. It works on all aspects of the person like the physical, vital, mental, emotional, psychic and spiritual.

Yoga arose in the age of the Vedas and Upanishads. It is India's oldest scientific, perfect spiritual discipline. Yoga is a method of training the mind and developing its power of subtle perceptions, so that many discover for himself the spiritual truths on which religion, beliefs and moral values finally rest. It is realization of our hidden powers. Yoga cannot provide a cure for life but it does present a proven method for coping with it.

YOGA:

The word yoga comes from Sanskrit word yuj, which means Union. Yoga is said to be for the purpose of uniting the mind, body, and spirit. The calm of the senses and the mind has been defined as yoga. The Sanskrit word; yoga also means a yoke or like a link between the spiritual aspirant and God, Yoga is a path or technique which we can establish communion with God.

METHODOLOGY:

To achieve the purpose of this study 40 college men students of Government Degree College, Dharmavaram, Ananthapuramu-dist, are selected as subject. The selected subjects are divided into two groups. Group-A underwent the yogic practices and group –B underwent physical exercises practices. The Subject's are ranges 18 to 21 years. The subjects were selected at random from the college Men Students. The Study was formulated as per post test pre experimental design.

The statistical analysis of the result obtained from the selected yogic practices and physical exercises on bio-chemical variables for college men students and their age 18 to 21 years. To find out the effect of selected physical exercises and yogic practices on bio-chemical variables among college Men students, and to determine the significant improvement of the study. To find out the man difference between the selected physical exercise and yogic practices group the 't' ratio was used as statistical techniques.

RESULT AND DISCUSSIONS

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TABLE 1: SIGNIFICANCE DIFFERENCE BETWEEN THE INTIAL AND THE FINAL MEANS OF THE SELECTED YOGIC PRACTICES AND PHYSCIAL EXERCISE GROUPS ON CHOLESTEROL IN Mg/dl

Group	Test	Mean	Standard Deviation	Standard Error	"t" Ratio
Selected Yogic Practice Group (N=20)	Pre-Test	174.6100	12.05638	3.81284	1.1771
	Post- Test	167.8999	6.3996	2.02457	
Physical Exercise Group (N=20)	Pre- Test	175.689	9.67299	3.05887	0.546
	Post-Test	178.1000	7.51940	2.37789	

Not Significant at 0.05 level of Confidence.

"t" value required at 0.05 level=2.262 with degrees of freedom =9.

The statistical result in Table indicates that the final mean (167.90) is decreased than the initial Mean (174.61) for selected yogic practice group. This shows the cholesterol level is decreased in selected yogic practice group. In the physical exercise group the final mean (178.10) is higher than the initial mean (175.68). The "t" Value (1.1771) for selected yogic group and (0.546) for the physical exercise group derived from't' test is lower than the table value(2.262) with degrees of freedom 9 and at 0.05 level of confidence. Hence, the result shown by the selected yogic practices and physical exercise group for cholesterol is not significant.

ANALYSIS OF TRYGLYCERIDES

The table of statistical description revealed that effect of ;selected yogic practices and physical exercise groups on triglycerides.

TABLE II: SIGNIFICANCE DIFFERENCE BETWEEN THE INITIAL AND THE FIANAL MEANS OF SELECTED YOGEIC PRACICES AND PHYSICAL EXERCISE GROUP ON TRIGLYCERIDES IN Mg/dl

Group	**Test**	**Mean**	**Standard Deviation**	**Standard Error**	**"t" Ratio**
Selected Yogic Practice Group (N=20)	**Pre-Test**	**146.80**	**19.57209**	**6.18924**	**3.727**
	Post- Test	**159.60**	**15.86190**	**5.01597**	
Physical Exercise Group (N=20)	**Pre- Test**	**147.60**	**17.83380**	**5.63954**	**2.201**
	Post-Test	**173.80**	**38.51926**	**12.18086**	

Not Significant at 0.05 level of Confidence.

"t" value required at 0.05 level=2.262 with degrees of freedom =9.

The statistical result presented in the table II denoted that in both the selected yogic practices and the physical exercise groups the final means are higher than the initial means. The calculated "t" value for selected yogic practices group is (3.727) is higher than the table value which is observed to the highly significant at 0.05 level of confidence. In physical exercise group the 't" value is (2.201) almost it reaches the table value but it is not significant.

ANALLYSIS OF HIGH DENSITY LIPOPROTIEN (HDL)

The statistical results shown in the table III shows the eff3ect of selected yogic practices and physical exercise groups on HIGH DENSITY LIPOPROTIEN (HDL)("good Cholesterol")

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TABLE III: SIGNIFICANCE DIFFERENCE BETWEEN THE INITIAL AND THE FIANAL MEANS OF SELECTED YOGIC PRACICES AND PHYSICAL EXERCISE GROUP ON HIGH DEN SITY LIPOPROTIEN (HDL) IN Mg/dl

Group	Test	Mean	Standard Deviation	Standard Error	"t" Ratio
Selected Yogic Practice Group (N=20)	Pre-Test	35.90	2.60128	0.82260	3.083
	Post- Test	33.60	2.01108	0.63596	
Physical Exercise Group (N=20)	Pre- Test	33.70	2.62679	0.83066	1.039
	Post-Test	34.80	1.68658	0.53333	

Not Significant at 0.05 level of Confidence.

"t" value required at 0.05 level=2.262 with degrees of freedom =9.

The above Table III shows that the "t" value of selected yogic practice group for HDL93.083) is higher than the table value. Hence it shows that it was found to be highly significant at 0.05 level of confidence. But in the physical exercise group the "t" value for HDL is lesser than the table value, so it found to be not significant at 0.05 level of confidence.

ANALYSIS OF LOW DENSITY LIPOPROTIEN (LDL)

The statistical results Show below in the table IV explain the effect of selected yogic practices and physical exercise groups on LOW DENSITY LIPOPROTIEN (LDL) ("BAD CHOLESTEROL")

TABLE IV: SIGNIFICANCE DIFFERENCE BETWEEN THE INITIAL AND THE FINAL MEANS OF SELECTED YOGIC PRACTICS AND PHYSICAL EXERCISE GROUPS ON LOW DENSITY LIPOPTOTIEN (LDL)IN mg/dl

Group	Test	Mean	Standard Deviation	Standard Error	"t" Ratio
Selected Yogic Practice Group (N=20)	Pre-Test	110.50	10.53302	3.33083	1.657
	Post- Test	105.10	8.3858	2.65183	
Physical Exercise Group (N=20)	Pre- Test	106.6.	5.08156	1.60693	0.187
	Post-Test	107.10	7.69488	2.4333	

Not significant at 0.05 level of confidence.

"t" value requir4ed at 0.05 level=2.262 with the degrees of freedom=9

The statistical result presented in Table IV denotes that the initial mean of LDL (110.50) of selected yogic practices group is higher than the final mean (105.10) and the "t" value (1.657) is lower than the table value. Therefore it is now significant at 0.05 levels. In the physical exercise group also the "t" value is less than the table value, it was also found to be not significant.

DISCUSSION ON FINDINGS

Based on the analysis of statistical results, of the selected yogic practices and physical exercise groups on all selected bio-chemical variables, it is Cleary observed that the selected yogic practices for eight weeks helped to decreased the bogy cholesterol levels. The result show that for both the selected ;yogic practices and the physical exercise groups the triglycerol level has increased through the eight week training programme. Hence the hypothesis was accepted here. The statistical analysis shown that the selected yogic practices and the physical exercise programme helped in increasing the good cholesterol that is HDL. The selected yogic practices

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group has improved higher than the physical exercise group. Hence the hypothesis was accpt4ed. The statistical actual results obtained from the "t" test showed that there were some decrements in LDL ("bad cholesterol"). Hence it was not significant.

On the basis of statistical analysis of the result and discussion on findings of this study, it was evident that regular selected yogic practice programme and physical exercise programme has helped to improve "good" cholesterol HDL, triglycerides and also helps to reduce the LDL ("bad" cholesterol). Hence it was not significant.

Hence, the tentatively assumed hypothesis has been accepted in case of triglycerides and HDL "GOOD" cholesterol. The hypothesis was rejected in case of LDL "Bad" cholesterol levels. Hence the hypothesis of the study was partially accepted.

CONCLUSIONS

From the statistical analysis of data, with the limitations imposed by the experimental conditions the following conclusions were drawn:

1. The selected yogic practices group had significantly improved inn body cholesterol.
2. The selected yogic practices group had insignificantly improved in triglyceride, HDL and LDL.
3. The physical exercise group had insignificantly improved in cholesterol, triglyceride, HDL and LDL.
4. The reason may be for in significant was the selected subjected were under gone various physical activities in their curriculum so no possibility of improvement on above variables for any endurance activities.
5. When the selected yogic practices group was compared with physical exercise group, there was significant improvement in triglycerides and HDL.

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ASSESSMENT OF EXPLOSIVE STRENGTH-ENDURANCE IN VOLLEYBALL PLAYERS THROUGH VERTICAL JUMPING TEST

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INTRODUCTION

Endurance assessment has been considered in volleyball due to the movements of explosive nature characteristics, which are associated with performance in actions of vertical jumps. The tests with vertical jumps are suggested for the estimation of explosive strength endurance of volleyball players, who are submitted to repetitive movements. During a game, these movements generate fatigue which effectively interferes in the performance of volleyball players. Concerning training, fatigue is understood as a transitory results decrease of the functional capacity of athletes, since it exposes the maintenance flaw in performance of certain variables, such as strength, velocity and power, Strength endurance, generally expressed by the ability of the neuromuscular system to delay the appearance of the fatigue process, considered as the impossibility to carry on applying technique and tactics during the game to the strength and optimum velocity, has as specific characteristic to give straight support in the vertical jumps actions in attack and blocking. In this case, endurance which is considered a component which contributes to the maintenance of such performance, keeps the athlete as close as possible to maximal performance.

According to the specialized literature, there are several types of tests with the purpose to measure the endurance capacity of explosive strength in volleyball players, such as the continuous vertical jump tests which have duration of fifteen seconds or sixty seconds. A particularity involving the methods with vertical jump tests is the repetitive use of a stretching and shortening cycle (SSC), derived from the lower limbs movements with actions of the vertical jump, however, it is worth mentioning that continuous and intense exercises with SSC are means applied in these sports modality as training. Moreover, it is important to examine the fatigue manifestation, especially in this kind of exercise, and describe how it affects the production of strength and muscular power. Nevertheless, in volleyball, a sport characterized by actions of short duration in a prolonged period of time, the manifestation of explosive strength endurance occurs under intermittent conditions. In the case of the vertical jump tests of continuous nature with 60 seconds, the results may be underestimated, since the interval periods during work enable the recovery to another physical effort.

Nevertheless, a certain lack of studies with the aim to verify the manifestation of explosive strength endurance is observed in the intermittent context derived from vertical jumping tests. Based on these premises, there is an issue to be solved about this aspect is it possible to find differences in the estimation of explosive strength endurance between the continuous vertical jump tests and the intermittent test of four 15 second-sets? Therefore, the aim of the present study was to verify the differences between the vertical jump test of continuous nature of 60 seconds and the vertical jump test of intermittent nature of four sets of 10 seconds.

METHODS

Characteristics of the participants

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Ten volleyball players (age range of 19.01 ± 1.36 years; height of 191.5 ± 5.36 cm; body mass of 81.74 ± 7.45 kg) participated in this group. The players had a mean of three years of experience with volleyball training and were registered in the Ananthapur District volley ball association. All players performed daily training sessions in a Police Training college which took part in the Volleyball Championship of Inter-District and Inter university level. The participants performed an adaptation process previous to the vertical jumping test so that error could be minimized.

Equipment

Wooden stadiometers were used in order to measure height; a Plena Lithium Digital electronic scale was used for body mass. For the explosive strength endurance measurement, a Jump Test con-tact mat connected to a digital timer, whose configuration implies the same principle of the Ergo jump was used .

Anthropometric variables

The height (H), and body mass (BM), anthropometric measurements were used for characterization of the studied subjects, all according to standardization.

Explosive strength endurance variables

In this study, the explosive strength endurance variables in both tests were: power peak (PP), mean power (MP) and fatigue index (FI). In the IVJT (intermittent vertical jump test), the PP was estimated according to the mean power produced in the first set and the MP estimated by the amount of work produced during a 60 second- effort, being performed in four sets of 15 seconds with 10 seconds intervals. The result was expressed in watts/kg (W.kg-1), according to the equations for estimation of PP and MP in the vertical jumping test described by Bosco . The FI estimated from the ratio between the power peak (power of the first set), and the mean power generated in the last set (fourth set), was determined through the equation described by Bosco , with the result being expressed in percentage (%). Concerning the CVJT (continuous vertical jump test), the PP was estimated by the mechanical power produced in the first 15 seconds of a 60-second work. The MP was estimated by the amount of work during a 60-second continuous effort. For PP and MP, the results were expressed in watts/kg (W.kg-1), according to the equation described by Bosco . The FI estimation was calculated between the power peak (work produced in the first 15 seconds), and the mean power generated in the last 15 seconds of a vertical jump work with 60 seconds of duration. The result was expressed in percentage (%). The variables of the quality indicators of CVJT and IVJT were comprehended by the numbers of vertical jumps in 15-second (NVJ15sec), and 60 second work (NVJ60sec), in the vertical jump height in 15 (VJ15sec) and 60-second work (VJ60sec).

Vertical jumping tests:

The explosive strength endurance was estimated through the vertical jumping tests in the continuous and intermittent contexts. For both tests, the vertical jumps of continuous (CVJT) and intermittent nature (IVJT), were applied to the vertical jump technique with counter-movement, with no aid of the upper limbs (CMJ), a procedure described by Komi, Bosco . For that purpose, all participants performed knee flexion up to 110° angle, having it justified by an optimum angle for the application of strength.

The participants were told to perform the continuous vertical jumps during a work performed at maximal effort, with no pauses between jumps. The subjects were told to keep chest in vertical position, with no excessive advance to avoid influence in the results; as well as to keep knees in extension during the flight, remaining with hands around waist.

The IVJT had four sets of 15 seconds of continuous vertical jumps with a 10-second recovery interval between each set, following procedure described by Hespanhol . The CVJT had jumps during 60 seconds with procedures according to description by Bosco et al.(13) The intra class correlation coefficient was calculated for each variable of the tests (CMJ = 0.99; PP = 0.99; MP = 0.99; FI = 0.98). The results demonstrated high levels of reliability in the test-retest with vertical jumps.

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Data collection

The data collections were performed in the sports gymnasium of the Volleyball court, and the athletes were asked not to perform many extenuate activity 24 hs prior to the collections. The participants were evaluated in the jumping tests in the following order: firstly, the IVJT and seven days later, the CVJT. He anthropometric measurements were performed concomitantly to the IVJT.

The participants performed a 15-minute warm-up routine when performing the tests through stretching, running, coordination exercises and consecutive jumps (two sets of five vertical jumps).

Both tin the IVJT and CVJT the participants performed the jump action with the counter-movement technique with no aid of upper limbs (CMJ), 60 seconds after the warm-up end(14). Although three trails have been performed, the highest jump within the results was chosen so that the maximal intensity of the effort to be applied in the tests was checked and, consequently the effort intensity could be controlled.

It was previously established that if the participant could not reach 95% of the maximal intensity during the three first vertical jumps, the test would be interrupted and would be resumed in a second trial, right after 60 seconds. The participants were given stimulus to jump the highest as possible during the time estimated in both tests.

Statistical analysis procedures:

The results found were statistically treated by the Statistics software for Windows 6.0. Initially, descriptive statistical techniques were used. After this moment, K-S statistical technique was applied in order to verify the existence of normal data distribution, with the purpose to define the techniques to be applied in the comparative study. The Wilcoxon tests were applied to verify the existence of differences between the CVJT and IVJT, being the significance level used of $p < 0.05$.

RESULTS

In tables 1 and 2 the results found in the administration of the continuous and intermittent vertical jumping tests are presented. In the comparison done between tests, statistically significant differences were observed in the MP measurements ($p < 0.05$), FI ($p< 0.01$), NVJ60sec ($p < 0.01$) and VJ60sec ($p < 0.05$). Both in MP,NVJ60 sec and VJ60sec, the IVJT presented values higher than the CVJT. Concerning the mean values estimated for the FI of the continuous test, values of 48.6 ± 7.01% were found and for the intermit-

TABLE 1:
Description of the PP, PM and IF for each test and the comparison between tests
Variables

Variables	Continuous test			intermittent test			z	p
	n	Mean	SD	n	Mean	SD		
PP (W.kg-1)	10	27.76	3.78	10	27.29	3.99	–1.260**	0.208
FI (%)	10	48.60	7.01	10	59.33	4.92	–2.703 **	0.007
MP (W.kg-1)	10	19.56	2.59	10	21.12	3.43	–2.395**	0.017

* $p < 0.05$, ** $p < 0.01$; PP = Power Peak; MP = Mean Power; FI = Fatigue Index.

TABLE 2: Description of the quality indicators of the vertical jumping tests and comparison between tests

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Variables	Continuous test			intermittent test			z	p
	n	Mean	SD	n	Mean	SD		
CMJ (cm)	10	47.00	3.72	10	46.78	3.73	–1.826**	0.068
NVJ60seg	10	50.80	2.66	10	54.80	3.12	–2.677**	0.007
NVJ15seg	10	13.60	0.52	10	13.90	0.74	–1.342**	0.180
VJ15seg (cm)	10	39.59	3.98	10	38.50	4.16	–1.820**	0.069
VJ60seg (cm)	10	29.03	4.05	10	31.10	4.27	–2.398**	0.016

(* p < 0.05, ** p < 0.01; NVJ15sec = number of vertical jumps in 15; NVJ60sec = number of jumps in 60 seconds;VJ15sec = vertical jump height in a 15 sec work; VJ60sec =)

Vertical jump height intent jumping test, they were of 59.33 ± 4.92%, revealing greater Fatigue produced for the CVJT than for the IVJT. However, in the PP, CMJ, NVJ15sec, and VJ15sec variables, no statistically significant differences were found between tests; which denote in a similarity between the tests results considering these variables

DISCUSSION

It is important to observe from the performance under fatigue view point, that both continuous and intermittent tests produced decrease in PP performance. Such situation was also observed with college students, in which during the continuous and intermittent vertical jumping test, significant decrease occurred (p <0.001) in strength production and height jumped with the CMJ technique. This fact means that in both tests there is a certain degree of work under muscular fatigue conditions.

Evidence has shown that in the fatigue manifestations in the jumping tests, it is certified that the number of vertical jumps during 60 seconds in the intermittent test was higher than the number in the continuous one. In a certain extent, such fact is explained by the difficulty in the jumps coordination, since the subject when sustaining the power production in a maximal effort during 60 seconds of consecutive vertical jumps close to exhaustion, found greater difficulty than in 4 sets of 15 seconds. This fact was observed in continuous vertical jumps with volleyball and rugby players, in which there was significant increase in the muscles activation of the lower limbs (p < 0.05), in the vertical jumping action under muscular fatigue effect.

Several studies suggest that the muscular fatigue effects in the stretching and shortening cycle (SSC) lead to different proportions to the contractible, recruiting, elastic and reflex components when the test requires continuous vertical jumps for a prolonged period. It is believed that the lower fatigue result of the intermittent test may be explained due to some lower changes in the contractible and elastic components which improve performance. Although the effects for both tests are in neuromuscular performance terms similar to those which occur after continuous exercises with no recovery periods, the fatigue induced by the stretching cycle is much more problematic and complex due to the broader way it stimulates the neuromuscular system: mechanically and metabolically. Remarkably, related with neuromuscular adjustments which occur in a trial to compensate for the incapacity of the lower limbs muscles induced by the continuous jumps and prolonged under fatigue conditions .

Concerning recovery capacity, it was seen that the superiority presented in the MP results estimated by the intermittent test, may be justified by the recovery capacity of the subjects during repeated work with intermittent nature. Nevertheless, such fact is due to different factors, such as the subjects' recovery in the four sets of 15 seconds test, and the contribution of the metabolism in order to keep the amount of repeated muscular work with intermittent nature.

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Therefore, it is believed that there is a decrease of vertical jump height differences of the number of vertical jumps and consequently the power generated to keep the jump height in exhaustion process. Thus, continuously jumping close to exhaustion may indicate that the continuous vertical jump method is not the best test, once exhaustion may lead the athlete to compensate fatigue by other mechanisms.

CONCLUSION

Based on the results, the IVJT seems to be one of the most suitable tests for the estimation of explosive strength endurance in male volleyball players. This evidence can be observed in the different comparisons between vertical jumping tests which point

out some important indicators:

a) The intermittent test presented greater amounts of work in a 60 second-effort in relation to the continuous test;

b) The FI of the IVJT was lower than of the CVJT, showing that the higher fatigue manifestations are generated by the CVJT indices. Based on found results, it is suggested that the estimation of explosive strength endurance through the IVJT should be incorporated in sports training programs for volleyball, since in the analysis of the data generated by the test, the mean power (work amount), and the fatigue index (performance decline), the results are different from the CVJT, and consequently, by the specificity of a volleyball match, it is closer to the IVJT. The application of the IVJT is suggested for the evaluation of explosive strength endurance in volleyball players, since the use of CVJT results tend to underestimate performance.

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FITNESS AND WELLNESS TO THE SOCIETY THROUGH SPORTS

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"Sound mind in a sound body "a beautiful cote by Swami Vivekananda and it's the dream too. Our youth is strong back bone of our country. So most of the youth is in the colleges. So to build the strong and healthy country and the society the easy way to build the awareness of Physical Fitness and the good culture healthy habits in the youth

- Nowadays we can observe that the lack of fitness problems in the youth so to fulfill the theme fitness and wellness for the youth in the college itself . our aim is to see the nation to be strong with seeing that the youth should be fit in the colleges.

Physical fitness

- *Physical fitness* comprises two related concepts: general fitness (a state of health and well-being) and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations). Physical fitness is generally achieved through exercise correct nutrition and enough rest. It is an important part of life.
- In previous years, *fitness* was commonly defined as the capacity to carry out the day's activities without undue fatigue. However, as automation increased leisure time, changes in lifestyles following the industrial revolution rendered this definition insufficient. These days, *physical fitness* is considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases ,and to meet emergency situations.

Wellness

- A set of common characteristics seen in most thoughtful attempts at a definition of wellness. We generally see a reference to a "state of well-being," which is vague, to say the least. Also frequently seen is a "state of acceptance or satisfaction with our present condition."
- **Wellness** is generally used to mean a healthy balance of the mind, body and spirit that results in an overall feeling of well-being. Wellness can also be described as "the constant, conscious pursuit of living life to its fullest potential."
- Wellness can be described as a state that combines health and happiness. Thus, those factors that contribute to being healthy and happy will also likely contribute to being well. Factors that contribute to health and happiness have long been recognized, at least since the time of Ancient Greeks. To achieve a state of wellness, one has to work on its determinants. The determinants of wellness are: better understanding of concepts like destiny, health practices, spirituality, family, environment, work, money and security, health services, social support and leisure.

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- The truth is wellness is a tough word to define. That said, we'll leave it to Charles B. Corbin of Arizona State University who gives this definition of wellness: "Wellness is a multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of well-being."
- Wellness is an active process of becoming aware of and making choices toward a more successful existence.
- Process means that improvement is always possible
- Aware means that we are continuously seeking more information about how we can improve.
- Choices means that we consider a variety of options and select those in our best interest.
- Success is determined by each individual to be their collection of life accomplishments

Dimensions of Wellness

If wellness is multidimensional, what are the dimensions of wellness? The most commonly described sub-dimensions are the following:

- Social Wellness
- Occupational Wellness
- Spiritual Wellness
- Physical Wellness
- Intellectual Wellness
- Emotional Wellness
- Environmental Wellness
- Financial Wellness
- Mental Wellness
- Ultimately, the dimensions of wellness all fall into two broader categories, being mental and physical. This is critical to note, as the mental or emotional component is often overlooked as focus on such main staples as physical fitness and chronic disease risk factors. In order to achieve a state of wellness in our own lives or try to guide others to it, we must pay due diligence to each of the dimensions. We may not all be physically fit or free from disease; we can, however, strive for increased wellness by working with what we've been dealt.

Social Wellness

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The social dimension of wellness encourages contributing to one's human and physical environment to the common welfare of one's community. Social Wellness emphasizes the interdependence with others and nature. It includes the pursuit of harmony in one's family.' As you travel a wellness path, you'll become more aware of your importance in society as well as the impact you have on nature and your community

So how can I improve social wellness?

- Practice self disclosure
- Get to know your personal needs and pursue things and people who nurture those needs
- Contact and make a specific effort to talk to the people who are supportive in your life
- Attend a Wellness Forum
- Join a club or organization that interests you
- The social dimension of wellness involves developing, nourishing and encouraging satisfying relationships

Environmental Wellness

Is important to lead a lifestyle that is respectful of our environment. This includes respecting nature and those species living in it. Also, respect for others living in our environment is just as necessary as respect for the physical environment itself. While today's climate is one of increased environmental awareness, the average person may still be unconcerned or simply uninformed about what he or she can do to help the environment. You don't have to be a member of an organization to help; an individual can help by simply leading an environmentally conscious life.

- Signs of Good Environmental Wellness
- You are aware of the limits of the earth's natural resources
- You conserve energy (i.e., Shutting off unused lights)
- You recycle paper, cans, and glass as much as possible
- You enjoy, appreciate, and spend time outside in natural settings
- You do not pollute the air, water or earth if you can avoid doing so.
- The environmental dimension of wellness involves accepting the impact we have on our world and doing something about it.

Mental Wellness

When searching the literature on mental health, it is difficult to find a straightforward definition of mental wellness. Instead, we define its absence.

Although many adults do not fit snugly into descriptions of depression and anxiety, depressive symptoms and behaviors that identify anxiety are seen in many people. Unfortunately, even if these adults recognize their depressive symptoms and feelings of anxiety, and even if low-cost treatment were available around the corner, the stigma of mental illness inhibits many of them from seeking help.

What Are Barriers to Mental Wellness?

- Age-related Changes
- Illness
- Attitudes of Others

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- Alcohol or Drugs
- Health Complaints
- Stigma

Emotional Wellness: The emotional dimension of wellness emphasizes an awareness and acceptance of one's feelings. Emotional wellness includes the degree to which one feels positive and enthusiastic about oneself and life. It includes the capacity to manage one's feelings and related behaviors including the realistic assessment of one's limitations, development of autonomy, and ability to cope effectively with stress. The emotionally well person maintains satisfying relationships with others.

Managing your life in personally rewarding ways, and taking responsibility for your actions, will help you see life as an exciting, hopeful adventure.

- As you travel the wellness path, you'll begin to believe that - emotionally.
- It's better to be aware of and accept our feelings than to deny them.
- It's better to be optimistic in our approach to life than pessimistic.

Tips to Increase Emotional Wellness

- Emotional wellness is striving to meet emotional needs constructively. It is maintaining good mental health, a positive attitude, high self-esteem, and a strong self-image. It is the ability to respond resiliently to emotional states and the flow of life every day. It is dealing with a variety of situations realistically and learning more about yourself and how things you do affect your feelings. It is taking responsibility for your own behavior and responding to challenges as opportunities.
- Practice optimism.
- Spend time with friends and family discussing important personal concerns and being supportive of each other.
- Participate in self-esteem workshops or support groups.
- Read a self-help book that is of interest to you.
- Learn time management skills and other stress management techniques.
- Attend a wellness forum.
- Smile at least 20 times each day.

Physical Wellness

The physical dimension of wellness encourages cardiovascular flexibility and strength and also encourages regular, physical activity. Physical development encourages knowledge about food and nutrition and discourages the use of tobacco, drugs and excessive alcohol consumption. Physical Wellness encourages consumption and activities which contribute to high level wellness, including medical self-care and appropriate use of the medical system.

Steps For Improving Physical Wellness /Physical Fitness

Physical wellness is the ability to apply your knowledge, motivation, commitment, behavior, self management, attitude, and skills toward achieving your personal fitness and health goals. A wise person once said, "Those who think they have no time for exercise will sooner or later have to find time for illness." Physical wellness can be maintained by applying the knowledge and skills of sound nutrition, exercise, and safety to everyday life.

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- Exercise three time a week, 20-30 minutes per session
- Use the stairs instead of the elevator or escalator, and walk whenever possible
- Get consistent and adequate sleep
- Use seat belts and helmets, and encourage others to do so
- Learn to recognize early signs of illness
- Listen to your body
- Eat breakfast - it's the most important meal of the day
- Eat a variety of healthy foods

Conclusion

With all the above facts we can know that Fitness is very necessary for life to lead the life without strain and wellness is most essential to lead the life happily. The stage make understand to our youth is in the college . So it's our responsibility to make understand that the both the above things are part and parcel to our life with this I conclude the topic

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YOGA: A WAY FOR HEALTHY LIVING

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INTRODUCTION

Yoga is a practical aid, not a religion. It is an ancient art based on a harmonizing system of development for the body, mind, and spirit. The continued practice of yoga leads any one to a sense of peace and well-being, and also a feeling of being at one with his/her environment.

The word 'Yoga' is derived from the Sanskrit word *yuj*, Yoga means union of the individual consciousness or soul with the Universal Consciousness or Spirit. Yoga is a 5000 year old Indian body of knowledge. Though many think of yoga only as a physical exercise where people twist, turn, stretch, and breathe in the most complex ways, these are actually only the most superficial aspects of this profound science of unfolding the infinite potentials of the human mind and soul.

The science of Yoga imbibe itself the complete essence of the Way of Life, including - *Gyan Yoga* or philosophy, *Bhakti Yoga* or path of devotional bliss, *Karma Yoga* or path of blissful action, and *Raja Yoga* or path of mind control. *Raja Yoga* is further divided into eight parts. At the heart of the *Raja Yoga* system, balancing and unifying these various approaches, is the practice of Yoga Asana.

Yoga: Contemporary relevance and importance

Yoga is a traditional method of meditation developed by the saints of ancient India. They practiced yoga as an effective method of controlling their mind and bodily activities.

Human beings are made up of three components – body, mind and soul. Corresponding to these there are three needs – health, knowledge and inner peace. Health is physical need, knowledge is

our psychological needs and inner peace is spiritual need when all three are present then there is a harmony and tranquility.

Yoga gives us relief from countless ailments at the physical level. The practice of the postures (asans) strengthens of the body and creates a feeling of well being. From the psychological view point, yoga sharpens the intellect and aid in concentration. It steadies the emotions and encourages a caring for others.

Today Yoga is not any art or science but considered as a technology full of moves to keep you happy and healthy. Yoga brings intense calmness and stability to several minds of its followers. It comprises of various moves, breathing exercises and meditation which fetch immense power to mental and physical health. Various studies have shown that it is the complete panacea for all types of diseases.

Especially today when there is an increase in privatization, globalization and urbanization, competition is also raised. Today everyone wants to work with blue chip and white collar organizations. Thus, with rising completion stress is also shooting like anything, here yoga plays most vital role in balancing equilibrium between your mind, body and soul. Meditation and breathing exercises help to combat organizational and family stress and pressure. This helps in achieving long term goals with high productivity, wealth maximization, profit maximization that too

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within optimum resource utilization. In this context, the paper tries to focus on importance and various benefits of yoga in day to day life.

Essentials of Yoga Practice

1. Convenient Time: Morning time, before breakfast, is regarded as the best time for practising yoga. One can do it also in the evening or at any other time, provided the stomach is empty and not heavy with food. The general principle is to give an interval of three to four hours after eating and then do yoga. Also a gap of half an hour or so should be given after drinking water, tea or any juice. The body should be in a restful and normal condition at the time of practising yoga.

An individual who wants to practice yoga should select a time which is convenience for his daily routine and should try to do yoga at the same time every day. A practice for at least five to six days in a week is enough to its show improvements in physical and mental conditions. The patients are advised to practice yoga only once in twenty-four hours unless specifically told to do so more often than that.

2. Suitable Place: Practice yoga on the floor. Avoid chowki or bed. Use a carpet, rug, blanket or mat on the floor. The place of practice should be neat, clean and well ventilated. There should be constant supply of fresh air at the place. Windows should be kept open for cross-ventilation. During summer a fan can be used. But during winter the draft of cold wind should be avoided. If the place is air conditioned, make sure that there is sufficient supply of air.

3. Maintain Silence: One should maintain silence and observe breathing while doing yoga. Any conversation, mental activity and even listening to music should be avoided. Silence helps in preserving energy as well as in being attentive during practice.

4. Proper rest: Rest in yoga are two types, one is short rest and other is long rest. The short rest should be for about six to eight seconds only. This is taken in between two rounds of the asana, or between one and the other asana. The shorter rest is completed by breathing twice at the completion of one round of a posture.

After the completion of all asanas, pranayamas and other kriyas which one does at a stretch should take long rest. The general principle is to devote one fourth of the actual yoga for twenty minutes, the rest at the end should be for five minutes.

Shava Asana is the best for taking long rest. Those who cannot do Shava Asana should just lie down on the floor, keeping the eyes closed, body loose, breathing normal, and concentrating the mind on any place of natural beauty such as a garden, park or hill side. In this simple method of resting there should be a feeling as if one is breathing the air of that chosen place and is relaxing by being mentally present there. After the rest is over, one should wait for three to five minutes before eating or doing any other routine work.

5. Suitable Dress: There should be minimum clothes on the body while doing yoga. Male practitioners can wear half-pants or pyjamas along with an underwear (such as, longot or kachha). Ladies can wear either sari, slacks or stretch-pants with blouse. In winter, light woollen clothes may be used while doing yoga.

6. Bath: People generally want to know whether bath should be taken before or after yoga practice. For those practising yoga in the morning, it is not necessary to take a bath before they do it. It depends on the convenience and personal choice of the practitioner to bath either before or after the practice. For taking a hot bath after yoga practice one must wait for about fifteen minutes. Many people prefer to practice yoga after taking a bath because there are certain asanas which are done better after the bath and it creates a feeling of neatness and purity.

Yoga: Psychological and physiological benefits

1. Improves one's flexibility

Improved flexibility is one of the first and most obvious benefits of yoga. During introducing class, one probably won't be able to touch his/her own toes. But if one sticks with it, one notices notice a gradual loosening, and

eventually, seemingly impossible poses will become possible. One will also probably notice that aches and pains start to disappear. That's no coincidence. Tight hips can strain the knee joint due to improper alignment of the thigh and shinbones. Tight hamstrings can lead to a flattening of the lumbar spine, which can cause back pain. And inflexibility in muscles and connective tissue, such as fascia and ligaments, can cause poor posture.

2. Builds muscle's stamina and strength

Strong muscles do more than look good. They also protect us from conditions like arthritis and back pain, and help prevent falls in elderly people. And when one builds strength through yoga, one can balance it with flexibility. If one goes to the gym and lifted weights, he/she might build strength at the expense of flexibility.

3. Perfects one's posture

Head is like a bowling ball—big, round, and heavy. When it's balanced directly over an erect spine, it takes much less work for your neck and back muscles to support it. Move it several inches forward, however, and one start to strain those muscles. Hold up that forward-leaning bowling ball for eight or twelve hours a day and it's no wonder one retires. And fatigue might not be your only problem. Poor posture can cause back, neck, and other muscle and joint problems. One's body may compensate by flattening the normal inward curves in one's neck and lower back. This can cause pain and degenerative arthritis of the spine.

4. Prevents cartilage and joint breakdown

Each time one practices yoga, he/she take his/her joints through their full range of motion. This can help prevent degenerative arthritis or mitigate disability by "squeezing and soaking" areas of cartilage that normally aren't used. Joint cartilage is like a sponge; it receives fresh nutrients only when its fluid is squeezed out and a new supply can be soaked up. Without proper sustenance, neglected areas of cartilage can eventually wear out, exposing the underlying bone like worn-out brake pads.

5. Protects spine

Spinal disks—the shock absorbers between the vertebrae that can herniate and compress nerves—crave movement. That's the only way they get their nutrients. If one has got a well-balanced asana practice with plenty of backbends, forward bends, and twists, one will help keep disks supple.

6. A boon for bones health

It's well documented that weight-bearing exercise strengthens bones and helps ward off osteoporosis. Many postures in yoga require that he/she lift his/her own weight. And some, like Downward- and Upward-Facing Dog, help strengthen the arm bones, which are particularly vulnerable to osteoporotic fractures. In an unpublished study conducted at California State University, Los Angeles, yoga practice increased bone density in the vertebrae. Yoga's ability to lower levels of the stress hormone cortisol may help keep calcium in the bones.

7. Increases blood flow

Yoga helps in free flaw of your blood. More specifically, the relaxation exercises practiced in yoga can help in circulation blood, and ensures supply oxygen especially in hands and feet. Yoga also gets more oxygen to cells, which function better as a result. Twisting poses are thought to wring out venous blood from internal organs and allow oxygenated blood to flow in once the twist is released. Inverted poses, such as Headstand, Handstand, and Shoulderstand, encourage venous blood from the legs and pelvis to flow back to the heart, where it can be pumped to the lungs to be freshly oxygenated. This can help the people who are suffering from swelling in legs and also prevents from heart or kidney problems. Yoga also boosts levels of hemoglobin and red blood cells, which carry oxygen to the tissues. And it thins the blood by making platelets less sticky and by cutting the level of clot-promoting proteins in the blood. This can lead to a decrease in heart attacks and strokes since blood clots are often the cause of these killers.

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8. Drains lymph and boosts immunity

When one's contract and stretch muscles, move organs around, and come in and out of yoga postures, that increases the drainage of lymph (a viscous fluid rich in immune cells). This further helps the lymphatic system fight infection, destroy cancerous cells, and dispose of the toxic waste products of cellular functioning.

9. Increase heart rate

When one regularly gets heart rate into the aerobic range, results in lower risk of heart attack and can relieve depression. While not all yoga is aerobic, if one does it vigorously or take flow or Ashtanga classes, it can boost your heart rate into the aerobic range. But even yoga exercises that don't get heart rate up that high can improve cardiovascular conditioning. Studies have found that yoga practice lowers the resting heart rate, increases endurance, and can improve one's maximum uptake of oxygen during exercise—all reflections of improved aerobic conditioning. In another study it is found that subjects who were taught only pranayama could do more exercise with less oxygen.

10. Decreases high blood pressure

Regular practice of yoga reduces high blood pressure and protects the heart-related diseases. Two studies of people with hypertension, published in the British medical journal *The Lancet*, compared the effects of Savasana (Corpse Pose) with simply lying on a couch. After three months, Savasana was associated with a 26-point drop in systolic blood pressure (the top number) and a 15-point drop in diastolic blood pressure (the bottom number—and the higher the initial blood pressure, the bigger the drop.

11. Regulates adrenal glands

Yoga lowers cortisol levels. If that doesn't sound like much, consider this. Normally, the adrenal glands secrete cortisol in response to an acute crisis, which temporarily boosts immune function. If the cortisol levels stay high even after the crisis, they can compromise the immune system. Temporary boosts of cortisol help with long-term memory, but chronically high levels undermine memory and may lead to permanent changes in the brain. Additionally, excessive cortisol has been linked with major depression, osteoporosis (it extracts calcium and other minerals from bones and interferes with the laying down of new bone), high blood pressure, and insulin resistance. In rats, high cortisol levels lead to what researchers call "food-seeking behavior" (the kind that drives you to eat when you're upset, angry, or stressed). The body takes those extra calories and distributes them as fat in the abdomen, contributing to weight gain and the risk of diabetes and heart attack.

12. Makes happier

Feeling sad? Sit in Lotus. Better yet, rise up into a backbend or soar royally into King Dancer Pose. While it's not as simple as that, one study found that a consistent yoga practice improved depression and led to a significant increase in serotonin levels and a decrease in the levels of monoamine oxidase (an enzyme that breaks down neurotransmitters) and cortisol. At the University of Wisconsin, Richard Davidson, found that the left prefrontal cortex showed heightened activity in meditators, a finding that has been correlated with greater levels of happiness and better immune function. More dramatic left-sided activation was found in dedicated, long-term practitioners.

13. Brings changes in lifestyle

Move more, eat less—that's the adage of many a dieter. Yoga can help on both fronts. A regular practice gets one moving and burns calories, and the spiritual and emotional dimensions of practice may encourage to less eating and reduce weight problems on a deeper level. Yoga may also inspire to become a more conscious eater.

14. Lowers the levels of blood sugar

Yoga lowers blood sugar and LDL ("bad") cholesterol and boosts HDL ("good") cholesterol. In people with diabetes, yoga has been found to lower blood sugar in several ways: by lowering cortisol and adrenaline levels,

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encouraging weight loss, and improving sensitivity to the effects of insulin. Get one's blood sugar levels down, and decrease the risk of diabetic complications such as heart attack, kidney failure, and blindness.

15. Makes one to live in the present and to helps enjoys future

An important component of yoga is focusing on the present. Studies have found that regular yoga practice improves coordination, reaction time, memory, and even IQ scores. People who practice Transcendental Meditation demonstrate the ability to solve problems and acquire and recall information better—probably because they're less distracted by their thoughts, which can play over and over like an endless tape loop.

16. Relaxes one's system and functioning of vital organs

Yoga encourages one to relax, slow one's breath, and focus on the present, shifting the balance from the sympathetic nervous system (or the fight-or-flight response) to the parasympathetic nervous system. The latter is calming and restorative; it lowers breathing and heart rates, decreases blood pressure, and increases blood flow to the intestines and reproductive organs—comprising what Herbert Benson, M.D., calls the relaxation response.

17. Brings proper balance between the mind and body

Regularly practicing yoga increases proprioception (the ability to feel what your body is doing and where it is in space) and improves balance. People with bad posture or dysfunctional movement patterns usually have poor proprioception, which has been linked to knee problems and back pain. Better balance could mean fewer falls. For the elderly, this translates into more independence and delayed admission to a nursing home or never entering one at all. For the rest of us, postures like Tree Pose can make us feel less wobbly on and off the mat.

18. Maintains nervous system

Some advanced yogis can control their bodies in extraordinary ways, many of which are mediated by the nervous system. Scientists have monitored yogis who could induce unusual heart rhythms, generate specific brain-wave patterns, and, using a meditation technique, raise the temperature of their hands by 15 degrees Fahrenheit. If they can use yoga to do that, perhaps one could learn to improve blood flow to pelvis if one is trying to get pregnant or induce relaxation when one is having trouble falling asleep.

19. Releases tension in limbs

If one observes any one holding the telephone or a steering wheel with a death grip or scrunching one's face when staring at a computer screen, in all these unconscious habits can lead to chronic tension, muscle fatigue, and soreness in the wrists, arms, shoulders, neck, and face, which can increase stress and worsen one's mood. As one practice yoga, begin to notice where one hold tension: It might be in one's tongue, one's eyes, or the muscles of one's face and neck. If one simply tunes in, one may be able to release some tension in the tongue and eyes. With bigger muscles like the quadriceps, trapezius, and buttocks, it may take years of practice to learn how to relax them.

20. Helps in getting sound and undisturbed sleep

Stimulation is good, but too much of it taxes the nervous system. Yoga can provide relief from the hustle and bustle of modern life. Restorative asana, yoga nidra (a form of guided relaxation), Savasana, pranayama, and meditation encourage *pratyahara*, a turning inward of the senses, which provides downtime for the nervous system. Another by-product of a regular yoga practice, studies suggest, is better sleep—which means one will be less tired and stressed and less likely to have accidents.

21. Boosts one's immune system functionality

Asana and pranayama probably improve immune function, but, so far, meditation has the strongest scientific support in this area. It appears to have a beneficial effect on the functioning of the immune system, boosting it when needed (for example, raising antibody levels in response to a vaccine) and lowering it when needed (for instance, mitigating an inappropriately aggressive immune function in an autoimmune disease like psoriasis).

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22. Improves lungs functioning

Yogis tend to take fewer breaths of greater volume, which is both calming and more efficient. A 1998 study published in The Lancet taught a yogic technique known as "complete breathing" to people with lung problems due to congestive heart failure. After one month, their average respiratory rate decreased from 13.4 breaths per minute to 7.6. Meanwhile, their exercise capacity increased significantly, as did the oxygen saturation of their blood. In addition, yoga has been shown to improve various measures of lung function, including the maximum volume of the breath and the efficiency of the exhalation.

Yoga also promotes breathing through the nose, which filters the air, warms it (cold, dry air is more likely to trigger an asthma attack in people who are sensitive), and humidifies it, removing pollen and dirt and other things one did rather not take into lungs.

23. Prevents Irritable Bowel Syndrom and other digestive problems

Ulcers, irritable bowel syndrome, constipation—all of these can be exacerbated by stress. So if one's stress level is less, it makes him/her suffer less. Yoga, like any physical exercise, can ease constipation—and theoretically lower the risk of colon cancer—because moving the body facilitates more rapid transport of food and waste products through the bowels. And, although it has not been studied scientifically, yogis suspect that twisting poses may be beneficial in getting waste to move through the system.

24. Gives peace of mind and makes individuals assertive

Yoga quells the fluctuations of the mind, according to Patanjali's Yoga Sutra. In other words, it slows down the mental loops of frustration, regret, anger, fear, and desire that can cause stress. And since stress is implicated in so many health problems—from migraines and insomnia to lupus, MS, eczema, high blood pressure, and heart attacks—if one learns to quiet one's mind, will likely to live longer and healthier.

25. Increases one's self image and self-esteem

Many of us suffer from chronic low self-esteem. If one handle this negatively—take drugs, overeat, work too hard, sleep around—one may pay the price in poorer health physically, mentally, and spiritually. If you take a positive approach and practice yoga, you'll sense, initially in brief glimpses and later in more sustained views, worthwhile or, as yogic philosophy teaches, that one is a manifestation of the Divine. If one practice regularly with an intention of self-examination and betterment—not just as a substitute for an aerobics class—you can access a different side of oneself. One will experience feelings of gratitude, empathy, and forgiveness, as well as a sense that one is a part of something bigger. While better health is not the goal of spirituality, it's often a by-product, as documented by repeated scientific studies.

26. Relief from pains

Yoga can ease pains. According to several studies, asana, meditation, or a combination of the two, reduced pains in people with arthritis, back pain, fibromyalgia, carpal tunnel syndrome, and other chronic conditions. When one relieves one's pain, one's mood improves, one is more inclined to be active, and one don't need as much medication.

27. Gives inner strength

Yoga can help to make changes in one's life. In fact, that might be its greatest strength. Tapas, the Sanskrit word for "heat" is the fire, the discipline that fuels yoga practice and that regular practice builds. The tapas one develops can be extended to the rest of one's life to overcome inertia and change dysfunctional habits. One may find that without making a particular effort to change things, one start to eat better, exercise more, or finally quit smoking after years of failed attempts.

28. Connects with guidance

Good yoga teachers can do wonders for one's health. Exceptional ones do more than guide through the postures. They can adjust posture, gauge when one should go deeper in poses or back off, deliver hard truths

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with compassion, help one relax, and enhance and personalize one's practice. A respectful relationship with a teacher goes a long way toward promoting one's health.

29. Helps keep drug free

If medicine cabinet looks like a pharmacy, maybe it's time to try yoga. Studies of people with asthma, high blood pressure, Type II diabetes (formerly called adult-onset diabetes), and obsessive-compulsive disorder have shown that yoga helped them lower their dosage of medications and sometimes get off them entirely. Will result in spend less money, and you're less likely to suffer side effects and risk dangerous drug interactions.

30. Builds awareness for transformation within self

Yoga and meditation build awareness. And the more aware, the easier it is to break free of destructive emotions like anger. Studies suggest that chronic anger and hostility are as strongly linked to heart attacks as are smoking, diabetes, and elevated cholesterol. Yoga appears to reduce anger by increasing feelings of compassion and interconnection and by calming the nervous system and the mind. It also increases one's ability to step back from the drama of one's own life, to remain steady in the face of bad news or unsettling events. One can still react quickly when one need to—and there's evidence that yoga speeds reaction time—but one can take that split second to choose a more thoughtful approach, reducing suffering oneself and others.

31. Improves relationships

Love may not conquer all, but it certainly can aid in healing. Cultivating the emotional support of friends, family, and community has been demonstrated repeatedly to improve health and healing. A regular yoga practice helps develop friendliness, compassion, and greater equanimity. Along with yogic philosophy's emphasis on avoiding harm to others, telling the truth, and taking only what one need, this may improve one's relationships with fellow beings.

32. Uses sounds to soothe one's sinuses

The basics of yoga—asana, pranayama, and meditation—all work to improve one's health, but there's more in the yoga toolbox. Consider chanting. It tends to prolong exhalation, which shifts the balance toward the parasympathetic nervous system. When done in a group, chanting can be a particularly powerful physical and emotional experience. A recent study from Sweden's Karolinska Institute suggests that humming sounds—like those made while chanting *Om*—open the sinuses and facilitate drainage.

33. Guides your body's healing in your mind's eye

If one contemplates an image in one's mind's eye, as one does in yoga nidra and other practices, you can effect change in your body. Several studies have found that guided imagery reduced postoperative pain, decreased the frequency of headaches, and improved the quality of life for people with cancer and HIV.

34. Keeps allergies and viruses at bay

Kriyas, or cleansing practices, are another element of yoga. They include everything from rapid breathing exercises to elaborate internal cleansings of the intestines. Jala neti, which entails a gentle lavage of the nasal passages with salt water, removes pollen and viruses from the nose, keeps mucus from building up, and helps drains the sinuses.

35. Helps serve others

Karma yoga (service to others) is an integral part of yogic philosophy. And while one may not be inclined to serve others, one's health might improve if yoga is properly done. A study at the University of Michigan found that older people who volunteered a little less than an hour per week were three times as likely to be alive seven years later. Serving others can give meaning to one's life, and one's problems may not seem so daunting when one can see what other people are dealing with.

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36. Encourages self care

In much of conventional medicine, most patients are passive recipients of care. In yoga, it's what one does for oneself that matters. Yoga gives anyone the tools to help change, and one might start to feel better the first time one tries practicing. One may also notice that the more one commits to practice, the more one gets benefits. This result in three things: One get involved in one's own care, one discover that one's involvement gives the power to effect change, and seeing that one can effect change give one's hope. And hope itself can be healing.

37. Supports connective tissue

As one reads and practices the principles of yoga it improves one's health, and can probably notice a lot of overlap. That's because they're intensely interwoven. Change the posture and change the way one can breathe. Change one's breathing and changes one's nervous system. This is one of the great lessons of yoga. Everything is connected—one's hipbone to one's anklebone, one's to the community, community to the world. This interconnection is vital to understanding yoga. This holistic system simultaneously taps into many mechanisms that have additive and even multiplicative effects. This synergy may be the most important way of all that yoga heals.

38. Uses the placebo effect, to affect change

Just believing oneself ensures believing other's positively. Unfortunately, many conventional scientists believe that if something works by eliciting the placebo effect, it doesn't count. But most patients just want to get better, so if chanting a mantra—like you might do at the beginning or end of yoga class or throughout a meditation or in the course of your day—facilitates healing, even if it's just a placebo effect.

Conclusion

Thus, yoga is a practical philosophy involving every aspect of a person's being. It teaches the evolution of an individual by the development of self-discipline and self awareness. Anyone irrespective of age, health circumstances of life and religion can practice yoga. Yoga helps to discipline our sense of power with the power of our own. Yoga helps in holistic development of individual and this, in turn, helps in building good human relations and cordial relationships among the fellow beings in the society.

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CHANGE IN WOMEN LIFESTYLE : CHOOSING NUTRIENT-RICH FOODS AND EXERCISE FOR BETTER HEALTH

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Women have many unique health concerns — menstrual cycles, pregnancy, birth control, menopause — and that's just the beginning. Many diseases affect women differently and may even require distinct treatment. Women may also have specific concerns about aging, caregiving, emotional health issues, and skin care. Women and men also have many of the same health problems. But these problems can affect women differently. For example,

- Women are more likely to die following a heart attack than men
- Women are more likely to show signs of depression and anxiety than men
- The effects of sexually transmitted diseases can be more serious in women
- Osteoarthritis affects more women than men
- Women are more likely to have urinary tract problems

Many of the leading threats to women's health can be prevented — if we know how. Many women don't realize that they're at risk of illness and even death from chronic obstructive pulmonary disease — which includes bronchitis and emphysema. It's important to understand the common health risks that women face, but don't feel intimidated. Instead, do whatever you can to lead a healthy lifestyle — including eating a healthy diet, staying physically active and getting regular checkups. Simple preventive measures can go a long way toward reducing your health risks.

A balanced diet is a cornerstone of health. Women, like men, should enjoy a variety of foods, such as whole grains, fruits, vegetables, healthy fats, low-fat dairy and lean protein. But women also have special nutrient needs, and, during each stage of a woman's life.

nutrient-rich food

A nutrient-rich food contains many vitamins and minerals (also called micronutrients) but not very many calories. Vitamins and minerals nourish our body and help us to keep our healthy and reduce your risk for chronic diseases. we can get the micronutrients through a variety of healthy foods, such as fruits, vegetables, whole grains, legumes, nuts and seeds, low-fat and fat-free dairy products, and lean meats and fish. Getting vitamins and minerals through food ensures that our body is able to absorb them properly.

Eating Right

Nutrient-rich foods provide energy for women's busy lives and help to prevent disease. A healthy daily diet includes:

- At least three 1-ounce servings of whole grains such as whole-grain bread, cereal, pasta, brown rice or oats.
- Three servings of low-fat or fat-free dairy products including low-fat or fat-free milk, yogurt or cheese.
- Five to 6 ounces of protein such as lean meat, chicken, turkey, fish, eggs, beans or peas and nuts.
- Two cups of fruits — fresh, frozen or canned without added sugar.
- Two-and-a-half cups of colorful vegetables — fresh, frozen or canned without added salt.

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Iron-rich Foods

Iron is one of the keys to good health and energy levels in women. Iron-rich food sources include red meat, chicken, turkey, pork, fish, kale, spinach, beans, lentils and fortified breads and cereals. Plant-based sources of iron are more easily absorbed by your body when eaten with vitamin C-rich foods. So eat fortified cereal with strawberries on top, spinach salad with mandarin orange slices or add tomatoes to lentil soup.

Folic Acid During the Reproductive Years

When women reach childbearing age, they need to eat enough folic acid to decrease risk of birth defects. The requirement is at least 400 micrograms of folic acid a day. Be sure to consume adequate amounts of folic acid daily from fortified foods or supplements, in addition to food forms of folate from a varied diet. Citrus fruits, leafy greens, beans and peas naturally contain folate. There are many folic acid fortified foods such as cereals, rice and breads.

Daily Calcium Requirements

For healthy bones and teeth, women need to eat a variety of calcium-rich foods every day. Calcium keeps bones strong and prevents osteoporosis, a bone disease in which the bones become weak and break easily. Some calcium-rich foods include low-fat or fat-free milk, yogurt and cheese, sardines, tofu (if made with calcium sulfate) and calcium-fortified foods including juices and cereals.

Foods to Limit

To keep weight in check at any age, women should avoid a lot of excess calories from added sugars, fat and alcohol.

- Limit regular soft drinks, sugar-sweetened beverages, candy, baked goods and fried foods.
- Limit alcohol intake to one drink per day. One drink is equal to 12 ounces of beer, 5 ounces of wine or 1.5 ounces of liquor.
- Opt for low-fat dairy and meat products instead of their full-fat counterparts.

Eat fewer foods that are high in saturated fat — the kind found in fatty meats, sausages, cheese and full-fat dairy products, baked goods and pizza.

Balancing Calories with Activity

Since women typically have less muscle, more fat and are smaller than men, you need fewer calories to maintain a healthy body weight and activity level. Moderately active women need 1,800 to 2,200 calories a day. Women who are more physically active may require more calories.

When combined with exercise, a healthy diet can help you lose weight, lower your cholesterol level, and improve the way your body functions on a daily basis. People of different ages and activity levels have different calorie needs. How much you eat of a certain type of food, such as fruits and vegetables, should depend on your individual calorie needs. For example, a person who needs 1,000 calories per day will have food serving requirements that are different from someone who needs 1,600 calories per day.

Exercise Regularly

Exercise is an important part of a woman's health. Regular daily activity helps with weight control, muscle strength and stress management. Exercising regularly, every day if possible, is the single most important thing you can do for your health. In the short term, exercise helps to control appetite, boost mood, and improve sleep. In the long term, it reduces the risk of heart disease, stroke, diabetes, dementia, depression, and many cancers. As it turns out, fulfilling the exercise requirements may depend on several things, including your age, resting heart rate, muscle strength, and present level of conditioning. We need to have full understanding of what you're doing when you exercise is important. Exercise as any activity requiring us to generate force by using our muscles. The more force we exert, the more exercise we get. Exercise has many health and longevity benefits.

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Benefits of regular exercise

- Reduces your risk of heart disease, high blood pressure, osteoporosis, diabetes, and obesity
- Keeps joints, tendons, and ligaments flexible, which makes it easier to move around
- Reduces some effects of aging, especially the discomfort of osteoarthritis
- Contributes to mental well-being
- Helps relieve depression, stress, and anxiety
- Increases your energy and endurance
- Helps you sleep better

For adults of all ages

- At least 150 minutes of moderate aerobic exercise like brisk walking or 75 minutes of rigorous exercise like running (or an equivalent mix of both) every week. It's fine to break up exercise into smaller sessions as long as each one lasts at least 10 minutes.

Strength-training that works all major muscle groups—legs, hips, back, abdomen, chest, shoulders, and arms—at least two days a week. Strength training may involve lifting weights, using resistance bands, or exercises like push-ups and sit-ups, in which your body weight furnishes the resistance.

Sneak exercise into your day

- Take the stairs instead of the elevator.
- Go for a walk during your coffee break or lunch.
- Walk part or all of the way to work.
- Do housework at a brisk pace.
- Work in your yard or garden.

The following are some tips that will help you stick with an exercise program:

- **Choose an activity you like to do.** Make sure it suits you physically, too. For example, if you have arthritic joints, swimming might be a good option.
- **Get a partner.** Exercising with a friend or relative can make it more fun. An exercise partner can offer support and encouragement. Also, you will be less likely to skip a day of exercise if someone else is counting on you.
- **Vary your routine.** You are less likely to get bored or injured if you have some variety in your exercise routine. Walk one day. Ride your bicycle the next. Consider activities like dancing and racquet sports, and even chores like vacuuming or mowing the lawn.
- **Choose a comfortable time of day.** Don't work out too soon after eating or when it's very hot or cold outside. If you're too stiff to exercise in the morning, wait until later in the day.
- **Don't get discouraged.** It can take weeks or months before you notice some of the benefits of exercise, such as weight loss.
- **Forget "no pain, no gain."** While a little soreness is normal after you first start exercising, pain isn't. Take a break if you are in pain or if you are injured.
- **Make exercise fun.** Read, listen to music, or watch TV while you ride a stationary bicycle, for example. Find fun activities, like taking a walk through the zoo. Go dancing. Learn how to play a sport you enjoy.

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SPORTS AND WELLBIENG

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INTRODUCTION

Etymology

"Sport" comes from the old French *"desport"* meaning "leisure", with the oldest definition in English from around being "anything humans find amusing or entertaining".

Other meanings include gambling and events staged for the purpose of gambling; hunting; and games and diversions, including ones that require exercise. Roget's defines the noun sport as an "activity engaged in for relaxation and amusement" with synonyms including diversion and recreation.

Nomenclature

The singular term "sport" is used in most English dialects to describe the overall concept (e.g. "children taking part in sport"), with "sports" used to describe multiple activities (e.g. "football and rugby are the most popular sports in England"). American English uses "sports" for both terms.

Definition

The precise definition of what separates a sport from other leisure activities varies between sources. The closest to an international agreement on a definition is provided by Sport Accord, which is the association for all the largest international sports federations (including associatio football, athletics, cycling, tennis, equestrian sports and more), and is therefore the *de facto* representative of international sport.

Sport Accord uses the following criteria, determining that a sport should:

- have an element of competition
- be in no way harmful to any living creature
- not rely on equipment provided by a single supplier (excluding proprietary games such as arena football)
- not rely on any "luck" element specifically designed into the sport

They also recognize that sport can be primarily physical (such as rugby or athletics), primarily mind (such as chess or go), predominantly motorized (such as Formula or power boating), primarily co-ordination (such as billiard sports), or primarily animal-supported (such as equestrian sport).

The inclusion of mind sports within sport definitions has not been universally accepted, leading to legal challenges from governing bodies in regards to being denied funding available to sports. Whilst Sport Accord recognizes a small number of mind sports, it is not open to admitting any further mind sports.

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There has been an increase in the application of the term "sport" to a wider set of non-physical challenges such as electronic sports, especially due to the large scale of participation and organized competition, but these are not widely recognized by mainstream sports organizations.

Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. It is performed for various reasons, including strengthening muscles and the cardiovascular system, honing athletic skills, weight loss or maintenance, and merely enjoyment. Frequent and regular physical exercise boosts the immune system and helps prevent the "diseases of affluence" such as heart disease, cardiovascular disease, Type diabetes, and obesity. It may also help prevent depression, help to promote or maintain positive self-esteem, improve mental health generally, and can augment an individual's sex appeal or body image, which has been found to be linked with higher levels of self-esteem.Childhood obesity is a growing global concern, and physical exercise may help decrease some of the effects of childhood and adult obesity. Health care providers often call exercise the "miracle" or "wonder" drug—alluding to the wide variety of proven benefits that it can provide.

In the United Kingdom two to four hours of light activity are recommended during working hours. This includes walking and standing.

Brain function

Main article: Neurobiological effects of physical exercise

Physical activity has been shown to be neuroprotective in many neurodegenerative and neuromuscular diseases. Evidence suggests that it reduces the risk of developing dementia. The Caerphilly Heart Disease Study followed , male subjects over years and examined the association between regular physical exercise and dementia. The study found that men who exercised regularly had a % reduction in dementia when compared to the men who didn't exercise.

In addition, a review of cognitive enrichment therapies (strategies to slow or reverse cognitive decline) concluded that "physical activity, and aerobic exercise in particular, enhances older adults' cognitive function".

In mice, exercise improves cognitive functioning via improvement of spatial learning, and enhancement of synaptic plasticity and neurogenesis. In a study, scientists made two groups of mice swim a water maze, and then in a separate trial subjected them to an unpleasant stimulus to see how quickly they would learn to move away from it. Then, over the next four weeks they allowed one group of mice to run inside their rodent wheels, an activity most mice enjoy, while they forced the other group to work harder on mini-treadmills at a speed and duration controlled by the scientists. They then tested both groups again to track their learning skills and memory. Both groups of mice improved their performances in the water maze from the earlier trial. But only the extra-worked treadmill runners were better in the avoidance task, a skill that, according to neuroscientists, demands a more complicated cognitive response.

The mice who were forced to run on the treadmills showed evidence of molecular changes in several portions of their brains when viewed under a microscope, while the voluntary wheel-runners had changes in only one area. According to an author of the study, "our results support the notion that different forms of exercise induce neuroplasticity changes in different brain regions."

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Furthermore, anecdotal evidence suggests that frequent exercise may reverse alcohol-induced brain damage.

There are several possibilities for why exercise is beneficial for the brain. Examples are as follows:

- increasing the blood and oxygen flow to the brain;
- increasing growth factors that help neurogenesis. and promote synaptic plasticity — possibly improving short and long term memory;
- increasing chemicals in the brain that help cognition, such as dopamine, glutamate, norepinephrine, and serotonin.

Physical activity is thought to have other beneficial effects related to cognition as it increases levels of nerve growth factors, which support the survival and growth of a number of neuronal cells.

Depression

Further information: Neurobiological effects of physical exercise § Antidepressant effect and Exercise-induced euphoria

Physical exercise, particularly aerobic exercise, has pronounced long-term antidepressant effects and can produce euphoria in the short-term.Numerous systematic reviews suggest that regular aerobic exercise (at sufficient intensity and duration) has comparable antidepressant efficacy to standard pharmaceutical antidepressants in treating depression. Consequently, current medical evidence supports the use of aerobic exercise as a treatment for depression. The biomolecular basis for exercise-induced antidepressant effects is believed to be a result of increased neurotrophic factor signaling, particularly brain-derived neurotrophic factor. Continuous exercise can produce short-term euphoria, colloquially known as a "runner's high" in distance running or a "rower's high" in crew, through the increased biosynthesis of at least three euphoriant neurochemicals: anandamide (an endocannabinoid), β-endorphin (an endogenous opioid), and phenethylamine (a trace amine and amphetamine analog).

Sleep

A review of published scientific research suggested that exercise generally improves sleep for most people, and helps sleep disorders such as insomnia. The optimum time to exercise *may* be to hours before bedtime, though exercise at any time of day is beneficial, with the possible exception of heavy exercise taken shortly before bedtime, which may disturb sleep. There is, in any case, insufficient evidence to draw detailed conclusions about the relationship between exercise and sleep.

According to a study, exercise is the most recommended alternative to sleeping pills for resolving insomnia. Sleeping pills are more costly than to make time for a daily routine of staying fit, and may have dangerous side effects in the long run. Exercise can be a healthy, safe and inexpensive way to achieve more and better sleep.

The **neurobiological effects of physical exercise** are numerous and involve a wide range of interrelatedneuropsychological changes. A large body of research in humans has demonstrated that consistent aerobic exercise(e.g., minutes every day) induces persistent beneficial behavioral and neural plasticity as well as healthy alterations in gene expression in the brain; some of these long-term effects include: increased neuron growth, increased neurological activity (c-Fos and BDNF signaling), improved stress coping, enhanced cognitive control over behavior, improved declarative and working memory, and structural and

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functional improvements in brain structures andpathways associated with cognitive control and memory. The effects of exercise on cognition have important implications for improving academic performance in children and college students, improving adult productivity, preserving cognitive function in old age, preventing or treating certain neurological disorders, and improving overall quality of life.

People who regularly participate in aerobic exercise have greater scores on neuropsychological function and performance tests. Examples of aerobic exercise that produce these changes are running, jogging, brisk walking, swimming, and cycling. Exercise intensity and duration are positively correlated with the release of neurotrophic factorsand the magnitude of nearly all forms of exercise-induced behavioral and neural plasticity; consequently, more pronounced improvements in measures of neuropsychological performance are observed in endurance athletes as compared with recreational athletes or sedentary individuals. Aerobic exercise is also a potent long-termantidepressant and a short-term euphoriant; consequently, consistent exercise has also been shown to produce general improvements in mood and self-esteem in all individuals.

The term **brain fitness** reflects a hypothesis that cognitive abilities can be maintained or improved by exercising the brain, in analogy to the way physical fitness is improved by exercising the body. Although there is strong evidence that aspects of brain structure remain plastic throughout life, and that high levels of mental activity are associated with reduced risks of age-related dementia, scientific support for the concept of "brain fitness" is limited. The term is virtually never used in the scientific literature, but is commonly used in the context of self-help books and commercial products. It first came into play in the s, and appeared in the titles of self-help books in and .

Brain fitness is the capacity of a person to meet the various cognitive demands of life. It is evident in an ability to assimilate information, comprehend relationships, and develop reasonable conclusions and plans. Brain fitness can be developed by formal education, being actively mentally engaged in life, continuing to learn, and exercises designed to challenge cognitive skills. Healthy lifestyle habits including mental stimulation, physical exercise, good nutrition, stress management, andsleep can improve brain fitness. On the other hand, chronic stress, anxiety, depression, aging, air pollution, decreasing estrogen, excess oxytocin, and prolongedcortisol can decrease brain fitness as well as general health.

As of , there was insufficient evidence to recommend any method of preventing age-related memory deficits or Alzheimers.

Neurogenesis

Neurogenesis is the creation of new neurons. The more active a particular brain cell is, the more connections it develops with its neighboring neurons through a process called dendritic sprouting. A single neuron can have up to thirty thousand such connections, creating a dense web of interconnected activity throughout the brain. Each neuron can then be stimulated directly through experience (real or imagined) or indirectly through these connections from its neighbors, which saves the cell from cell death.

Physical exercise boosts the brain's rate of neurogenesis throughout life, while mental exercise increases the rate at which those new brain cells survive and make functional connections into existing neural networks. Both

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physical exercise and the challenge from mental exercise increase the secretion of nerve growth factor, which helps neurons grow and stay healthy.

Role of neurotrophins

Brain fitness is purported to be positively influenced through mental and physical exercises that increase levels neurotrophins. Neurotrophins are a small class of proteins that are vital in neuronal development and function. In development, neurotrophins act to protect and warrant the survival of an adequate number of neurons. The survival of ample neurons is vital to ensure that they are match for target innervations. Neurotrophins also assist cell fate decisions, innervations patterns, the development of axons, dendrite pruning, etc. Neurotrophins are also important for regulating neural function and neuronal survival. Neurons are affected most predominantly by neurotrophins; however, they are important for many parts of the body in addition to the nervous system. Neurotrophins are crucial for the survival of neurons in the peripheral nervous system (PNS) as well as neurons in the central nervous system (CNS). The four most common neurotrophins are Nerve Growth Factor (NGF), Brain Derived Neurotrophic Factor (BDNF), Neurotrophic Factor- (NT-), and Neurotrophic Factor-/ (NT-/). In order to understand how neurotrophins affects brain fitness, it is important to understand how they work.

Nerve growth factor (NGF) was the first neurotrophin to be discovered and is the most famous. The effects of NGF are present in a multitude of tissues through human development as well as adulthood. NGF is associated with immunity, stress reaction, nerve maintenance and neurodegenerative diseases. NGF is known have a predominant effect on the sympathetic ganglion cells and dorsal root ganglion cells with free nerve endings and the cholinergic neurons of the basal nucleus. Sympathetic ganglion cells are masses of neuronal cell bodies in the sympathetic branch of the visceral (autonomic) nervous system. Dorsal root ganglion are masses of neuronal cell bodies in the posterior portion of the spinal cord where sensory information is processed. Cholinergic neurons are profuse in parts of the brainstem, the base of the forebrain, and the basal ganglia. They are thought to play a role in regulating the general level of activity of CNS neurons, especially during the different phases of wakefulness and sleep and also during learning. Therefore, it can be purported that increased secretion of NGF can stimulate the sympathetic nervous system, the sensory portion of the spinal cord, parts of the brainstem, the base of the forebrain, and the basal ganglia. Perhaps the roles of these individual structures can be facilitated or preserved with increased NGF.

Secretion of brain derived neurotrophic factor (BDNF) is stimulated by cortical neurons, and is essential for permanence of striatal neurons in the brain. Both patients with Alzheimer's and with Huntington disease exhibit reduced levels of BDNF. Striatal neurons are the nerve cells that make up the stratium. The stratium is an inclusive term for several structures of the midbrain. The stratium is the major point of entry for receiving input from most or all cortical areas and analyzing inhibitory outputs to the various parts of the midbrain. Therefore, it may be deduced that secretion of BDNF can have an influence on many parts of the cerebral cortex and coincidentally the functions of the areas influenced.

Spiral ganglion neurons are particularly sensitive to neurotrophic factor- (NT-). The spiral ganglion neurons contain the cell bodies of the auditory primary afferent fibers. The central process of these cells collect at the base of the cochlea to form the cochlear division of the eight nerve These afferent fibers carry auditory impulses

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toward the central nervous system. Therefore, it may be reasoned that healthy levels of NT- can preserve the function of these cells that are crucial for processing auditory information in the brain.

An article entitled "Neurotrophin / is a trophic factor for mammalian facial motor neurons" summarizes a study that was conducted on the researchers' findings in . The research suggests that NT-/ prevents injuries that cause death of facial motor neurons in neonatal rats. Additionally, there is functional receptor for NT-/ in facial motor neurons that can be serviceable thought embryonic development and even postnatal life. Thus, both NT-/and brain-derived neurotrophic factor (BDNF) may be physiological survival factors for facial motor neurons and may serve as restorative means for motor neuron disease.

Activities presumed to promote brain fitness

Not all brain activity exercises the brain in the same way.

- Activities that require you to use all your senses, break your routines and engage in novel experiences which can create BDNFs(neurotrophins) as explained in the book Keep Your Brain Alive, Workman Publishing.
- Activities that involve planning ahead, like chess, stimulate the frontal lobe area of the brain.
- Activities like ballroom dance and basketball, train short range spatial skills, used when one walks through a short limited space, like the interior of a house
- Activities like learning a new language or painting require the coordinating of multiple regions of the brain
- Physical exercise promotes BDNF.
- Reading books, and writing
- Cognitive training games

Practical effect:

A significant issue in brain fitness work has been establishing that brain training exercises have impacts on brain function that exist outside the context of the training task.

Other studies, however, have looked at changes in tests of everyday function that occur after brain-based training. In a review of these studies, the following significant effects were noted. Improvements on speed of processing training tests were related to improvements in the Timed Instrumental Activities of Daily Living test (TIADL). Evidence of ceiling effects were also noted, indicating that subjects who were further below normal at the beginning of training had the largest expected gains. Further, the effect sizes may be related to customizing the training difficulty to the performance level of the trainee. Subjects trained with one training strategy, the Useful Field of View test (UFOV), showed significant improvements in an on-the-road driving test designed to evaluate driver response during potential dangerous situations. Specifically, subjects trained with UFOV made fewer dangerous maneuvers after training. In another study, the researchers have found that action video game experience is shown to improve trainees' probabilistic inference. These results were established both in visual and auditory tasks, indicating generalization across modalities. In a study performed with Air force flight cadets it has been shown that training addressing attention control processes yielded significant transfer of skills from the training environment to actual flight.

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Lately, brain training games have been actively marketed as a "magic bullet" for Alzheimer's and Dementia. While there are few studies showing effectiveness of brain training for older adults, it has to be noted that many brain training games are purely commercial and have no scientific footing. To address growing public concerns with regard to aggressive online marketing of brain games to older population, a group of neuroscientists published a letter warning general public that there is a lack of research showing effectiveness of brain games in elderly. Authors of this letter suggest that many popular computerized training programs are not very effective and some other interventions, such intense physical exercise, may have greater benefits. With regard to research studies supporting benefits of brain training games for older adults, there is strong evidence that participants only gain in the trained task and that there is limited transfer of skills to the real life activities.

Another recent market for *Brain Training* services is children who are not meeting academic expectations in school. Student's performance on standardized norm-reference tests of cognitive abilities (e.g., Woodcock-Johnson Test of Cognitive Ability - IV) serve as a guide to determine which cognitive processes are relative strengths and weaknesses. For a description of these processes see Cattell–Horn–Carroll theory. A pre-training test provides both data on proposed weaknesses in need of training and a baseline measurement to compare performance on post-training administrations of the test. The assumption is that identifying and training a weaker cognitive process will result in generalizable improvements to academic performance. Cognitive training takes an analogue form of the skill performed on the test, and predictably does improve performance on that discrete skill in post-test measures. There is currently no evidence that this improvement in these discrete, trained skills, generalizes to better performance on higher order, more complex intellectual or academic skills.

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YOGA FOR EMPOWERMENT OF WOMEN HEALTH, FITNESS AND WELLBEING

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Abstract

Health and wellbeing can be influenced by our present life style change and psychological stress. Health is needed by everyone as without it there will be a lot of suffering. Development of the modern science by the way of improving medical attention has eliminated the threat of death. The life style diseases are now the primary causes of ill health and disorders. Sedentary life style increasing consumption of junk and fatty foods and addiction of bad habits naturally increases obesity, diabetes, hypertension etc. These are increasing at an alarming rate in people living at urban area especially women. Compared to men women are more sufferers to overweight and obesity. The link between diabetes and obesity is particularly pronounced in women. Women suffering from obese conditions are also prone to social and psychological issues that also lead to depression. Often women find it difficult to shed post pregnancy weight which is turn leads to lifelong obesity for them. Yogic activities are useful as an adjunct to modern medical treatment and in some cases can be the primary therapeutic modality. Asanas balance the different systems of the body by slowing down the mental activity, and by gently stretching the body and massaging the intra-abdominal organs. It also maintains equilibrium in body-mind complex. Regular practice of asana maintains the physical body in an optimum condition and promotes health even in an unhealthy body. Yoga aids in weight loss and correcting the digestive system. It cures constipation and helps in better absorption of food. Particular yoga poses stimulates the thyroid glands which regulates metabolism and corrects uterine displacement, menstrual and urinary disorders. Yoga has been found to lower fasting blood sugar in people with diabetes. Depression, anxiety and emotional disorders are corrected by anuloma viloma pranayama. Meditation makes the mind and body stable and helps women conceive and normalize cortisol levels, which are released as response to stress. Yoga is a risk-free activity, if performed regularly under expert guidance to get optimum healthy results.

Key words: Health, Wellbeing, Life style, Obesity, Sedentary.

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IMPORTANCE OF PHYSICAL EDUCATION AS A SUBJECT IN UNDER GRADUATE EDUCATION

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ABSTRACT

Under graduate education is one of the important part of education in student's life. Students who succeeds in scoring at this part, there future will be bright and there economical status will be in good condition. Students at this intersection will face several types of physical and mental problems. Some of the problems at the time of adolescence may be attributed to growth, building of muscle mass, increase in body fat, eating disorder, attraction towards opposite sex, late sleep, sleeping for a long time in the morning, anxiety, emotional problems, stress, behavioral problems, Motor development disorder, Eating disorder, Unhealthy dieting habits, Malnutrition and adolescent pregnancy. Attraction towards drugs, tobacco and alcohol is quite common in the case of under graduate students. Which may lead to health related problems and this practices may become a regular habit as they grow up. In order to avoid these types of problems the students has to be engaged in some type of physical activity. Physical education may be a suitable programe which may act as a remedial for all problems that students face at this stage of development.

Keywords: Under Graduate Education, Physical Education, Adolescence.

Human growth and development is a fascinating one. Growth and development will be the process of growing to maturity. In biological terms, this entails growth from a one-celled zygote to an adult human being. An individual after birth passes through different stages in his growth and development. The most important stage in an individual life span is the adolescence and puberty stage. Adolescence (from Latin adolescere, meaning "to grow up") is a transitional stage of physical and psychological human development that generally occurs during the period from puberty to legal adulthood (age of majority). The adolescence age that is 10 – 19 years can be sub divided as Early Adolescence (10 – 13 years), Middle adolescence (14 – 16 years) and Late adolescence (17 – 19 years). This is the age were the most of the physical and mental changes takes place and mostly remains through out there life span.

In studying adolescent growth and development, adolescence can be defined biologically, as the physical transition marked by the onset of puberty and the termination of physical growth; cognitively, as changes in the ability to think abstractly and multi-dimensionally; or socially, as a period of preparation for adult roles. Major pubertal and biological changes include changes to the sex organs, height, weight, and muscle mass, as well as major changes in brain structure and organization. Cognitive advances encompass both increases in knowledge and in the ability to think abstractly and to reason more effectively. Some of the problems at the time of adolescence may be attributed to growth, building of muscle mass, increase in body fat, eating disorder, attraction towards opposite sex, late sleep, sleeping for a long time in the morning, anxiety, emotional problems, stress, behavioral problems, Motor development disorder, Eating disorder, Unhealthy dieting habits, Malnutrition and adolescent pregnancy.

Students who are in under graduate education will not be aware of what they are living for. The biggest problem in the world of human beings, which can be seen, is that most human beings do not try to know why they are living and what they should have to live for their lives. Life is precious to anyone. However, ultimately

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few people lead their life with the correct understanding of life. Life can make anything happen. Hence it has to be maintained and preserved.

WHY WE NEED PHYSICAL EDUCATION IN UNDER GRADUATE EDUCATION

Eating disorder, unhealthy eating habit, moving more towards junk foods and consuming more sugar loaded drinks which pushes them towards obesity and overweight are the main problems of the under graduate students. The prevalence of obesity among adolescents aged 12 to 19 years increasing from year to year. Obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. Children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. Attraction towards drugs, tobacco and alcohol is quite common in the case of under graduate students. Which may lead to health related problems and this practices may become a regular habit as they grow up. These problems may effect there academic performance. Under graduate education is the vital part of life which decides the future education and the economic status of a particular student. Hence there is a need of a specific programme which keeps students physically and mentally healthy.

Physical Education is an education through physical activities. Physical education, as defined by the National Association for Sport and Physical Education (NASPE), is a curricular area offered in K–12 schools that provides students with instruction on physical activity, health-related fitness, physical competence, and cognitive understanding about physical activity, thereby enabling students to adopt healthy and physically active lifestyles.A high-quality physical education program enables students to develop motor skills, understand movement concepts, participate in regular physical activity, maintain healthy fitness levels, develop responsible personal and social behavior, and value physical activity".

As we know Health and physical education promotes the value of physical activity in students' lives. Among adolescents, physical activity is associated with benefits in the prevention and control of emotional distress, and improvement of self-esteem. Stress is an inevitable part of life. Participating in regular physical education classes will make students to control and maintain stress. Exercise and other physical activity produce endorphinschemicals in the brain that act as natural painkillersand also improve the ability to sleep, which in turn reduces stress.

By looking all above factors there is a need of a program along with their regular curriculum to maintain their physical and mental health. Physical education along with health education may play an important role in maintaining physical and mental health.Along with physical education health education as to go hand in hand. Knowledge regarding nutrition, hygiene, proper diet, what to eat and what not to eat should be provided to the Youngsters along with the Physical activities. Hence Physical Education and Health Education should be a part of curriculum and it should take a permanent place in the regular time table.

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THE SELF CONCEPT & MENTAL TOUGHNESS VOLLEYBALL PLAYERS BOYS & GIRLS OF TELANGANA

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Abstract
Self concept questionnaire constructed and standardized by Rajkumar Sarswat Whereas Mental toughness questionnaire constructed and standardized by Tiwari, Sharma and Jyoti were administered on 100 volleyball Players (50 male & 50 female) of Telangana. The age of subjects ranged between 19 to 26 years. The objectives of the study were to assess and compare the Self concept & Mental Toughness among male and female Volleyball players of Telangana. Statistical analysis has been done by t-test and the significance of the result was seen on 0.05 levels. The t-test showed that there were significant difference found in the sub-variables of self confidence, attention control and attitude control between male & Female Volleyball Players. There Were no significant difference were found in the self concept & sub-variable of motivation control, goal setting and visual and imagery and total mental toughness score.

Keywords : The Self Concept, Mental Toughness, Motivation, Attention, Goal Setting, Male & Female volleyball players.

Introduction : Certain Self Concept & Mental Toughness are the most important to achieve success in sports. Self concept is learned by an individual inference from his unique experiences. The individual perception of other towards him strongly influences his self image. self concept is highly complex component of behavior, composed of both cognitive and effective dimensions. Self concept has at least four orientations: The real self, the perceived self, the ideal self and the self as perceived by others. Mental toughness is the ability to consistently sustain one's ideal performance state during competition. The ultimate measure of mental toughness is consistency. The use of thinking skills, imagery, confidence building and other skills described later con be powerful techniques in reaching a high level of mental toughness. Most number of sports psychologists recognizes the fact that attention is multi-dimensional construct. By being mentally though, you can bring your talent and skill to light consistently.

Statement Of The Problem:
The self Concept & Mental toughness on selected volleyball players of Telangana.

Sample : A total number of one hundred (N=100) subjects belonging to age ranging 19-26 years were selected. 50 male volleyball players and 50 female volleyball players of Telangana were selected as a subject for the said study.

Methodology : The data was collected from 50 male volleyball players and 50 female volleyball players Boys & Girls of Telangana. The self concept questionnaire constructed and developed by Rajkumar Saraswat as well Tiwari, Sharma and Jyoti's mental toughness questionnaire was used as a tool to collect the data on mental toughness were employed to collect the data from the subjects. All the necessary instructions were given to the subjects before the subjects was requested to respond the statement in the questionnaire. The calculation of the questionnaire was based on five alternatives to give their responses ranging most acceptable to least acceptable description of the self concept. Whereas, the questionnaire was based on five alternatives to give

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responses ranging from strongly disagree to strongly agree description of the mental toughness. With the help of the scoring keys the researcher collects the raw scores, according to the instructions given in the manual.

Data Analysis And Discussion: The collected data were analyzed statistically computing Mean, S.D. and t-ratio to find out significant difference if any between two experienced groups on the psychological

Table – 1 : Significance Differences Of Mean Score At Self Concept Among Male & Female Volleyball Players Boys & Girls Of Telangana.

Variable	Group Compared	Mean	Standard Deviation	Significant "t" (0.05)	"t" Ratio
Self Concept	Male	16.6	2.75	2.04	0.22
	Female	18.2	4.14		

*Significant at 0.05 level.

The t-test showed that there were no significant difference in the "t" value exists between male and female volleyball players on self concept. As the calculated "t" (0.22) value is much lower than the tabulated "t" value (2.04) at 0.05 levels

Table-2: Significance Differences Of Mean Scores At Various Tools Of Mental Toughness Among Male & Female Volleyball Players Of Telangana.

Variables	Group Compared	Mean	Standard Deviation	Significant "t" (0.05)	"t" Ratio
Attention Control	MALE	37.420	4.233	2.118*	0.037
	FEMALE	35.380	5.333		
Motivation Control	MALE	34.260	5.286	0.186	0.853
	FEMALE	34.460	5.489		
Attitude Control	MALE	23.180	2.327	2.114*	0.037
	FEMALE	21.840	3.829		
Self Confidence	MALE	28.940	2.895	2.375*	0.019
	FEMALE	27.360	3.707		
Goal Setting	MALE	31.820	3.915	1.565	0.121
	FEMALE	30.560	4.131		
Visual and Imagery	MALE	23.760	3.047	0.906	0.367
	FEMALE	27.620	3.245		
Total Mental Toughness	MALE	176.540	21.208	0.769	0.444
	FEMALE	173.500	18.225		

*Significant at 0.05 level

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The t-test showed that there were significant difference in the "t" value between the elite sportsmen and the beginners on sub variables of Attention control, Attitude control and self confidence. Whereas no- significant difference were found in Motivation control, Goal setting, Visual and imagery and Total Mental toughness score among male and female volleyball players of Telangana.

Discussion Of Findings And Conclusions:

Within the limitation of the study the following conclusions may be drawn.

(1) In relation to self concept, the t-test showed that there were no significant difference in the "t" value exists between male and female volleyball players of Telangana.

(2) Whereas, significant difference found in the sub variable of mental toughness of Attention control, Attitude control and self-confidence scores among the male & female Volleyball players.

(3) But no significant difference found in Motivation control, Goal setting, Visual and imagery and Total Mental toughness score among the Male & Female Volleyball Players.

(4) The total mental toughness in conceded the mean scores of mental toughness of Male Volleyball players of Telangana were found to be more than the Female Volleyball players.

The Male Volleyball players have reflected better scores in self confidence, attention control and attitude control may be attributed to the fact that Male Volleyball players participate in various levels of competitions as well as more number of competitions as well as more number of competition participation at various situations whereas, such situations are limited in the Female Volleyball players of Telangana.

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A SOUND BODY- A SOUND MIND

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Let's give a thought to this. Do we really envisage this condition in the present day busy life where little kids, youngsters, busy-bee office goers, men, women- lead a life devoid of minimum physical exercise? The answer is inevitablly No!. The result of such a life has led to a lot of physical ailments, psychological stress and spiritual distress. Contemplating on this I am prompted to draw one's attention to the following:

At the outset a person who is hale and healthy is capable of living a life of contempt. Physical and mental fitness play very important roles in our lives and people who are both, physically and mentally fit are less prone to medical attention.

What is Fitness?

Fitness does not only refer to being physically fit, but also refers to a person's mental state as well. If a person is physically fit, but mentally unwell or troubled, he or she will not be able to function optimally. Mental fitness can only be achieved if your body is functioning well. You can help relax your own mind and eliminate stresses by exercising regularly and eating right.

Fitness and its importance:

People who are physically fit are healthier and are able to maintain their optimum weight, and are also not prone to cardiac and other health problems. In order to maintain a relaxed state of mind, a person should be physically active. A person who is fit both physically and mentally is strong enough to face the ups and downs and topsy-turvy situations in life, and is not affected by drastic changes that take place in life. .

How Can One Become More Physically Fit?

Fitness is very important for good health. Besides feeling better mentally, exercising can help protect you from heart disease, stroke, obesity, diabetes, and high blood pressure; and it can make you look younger, increase and maintain bone density, improve the quality of your life, and may keep you from getting sick. Exercising also helps you control stress better, and can make you feel happier and less nervous.

Before you start an exercise routine, ask your doctor about what exercises to do. Then make a plan to spend less time in front of the television and/or computer, and begin exercising more. Your doctor may suggest that you begin by doing little things first, such as parking in the farthest corner of your parking lot at work, taking the stairs rather than the elevator, taking your dog for a walk, or riding a stationary bike. Little by little, adding daily exercise will help you begin to feel better.

Eating healthy foods is important for good health, too. Changing the kinds of food you eat means paying attention to *what* you eat and *how much* you eat. Depending on your location of employment, it may be nearly impossible to get healthy food from vending machines or in a cafeteria, so you will need to be smart and make a good food plan for yourself. It is important to eat a healthy breakfast; eat more fruits, vegetables, salads, whole-grain breads, and egg whites; and foods that are boiled or grilled – not fried. Ask your doctor or a dietician about starting a healthy, balanced diet.

Advantages of Being Fit:

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By becoming more active you can increase your body's fitness levels and also avoid health problems like diabetes and high blood pressure from developing. Exercise is also good for your joints and makes your body stronger overall.

Facts about Health and Wellness

- Good health is of primary importance to adults in our society.
- Health varies greatly with income, gender, age, and family origin.
- Increasing the span of healthy life is a principal health goal. (Web)
- Health is more than freedom from illness and disease.
- Many illnesses are manageable and have only limited effect on total health.
- Wellness is the positive component of optimal health.
- Health and wellness are multidimensional.
- Wellness reflects how one feels about life as well as one's ability to function effectively.
- Health and wellness are integrated states of being.
- Health and wellness are individual in nature.
- It is possible to possess wellness while being ill or possessing a debilitating condition.
- Wellness is a useful term that may be used by quacks as well as experts.

Facts about Physical Fitness

- Physical fitness is a multidimensional state of being.
- The health-related components of physical fitness are directly associated with good health.
- The skill-related components of physical fitness are more associated with performance than good health.
- Metabolic fitness is a non-performance component of total fitness.
- Bone integrity is often considered to be a non-performance measure of fitness.
- The many components of physical fitness are specific in nature, but are also inter-related.
- Good physical fitness is important to, but is not the same as physical health and wellness.

The Facts about Healthy Lifestyles

- Lifestyle change, more than any other factor, is considered to be the best way of preventing illness and early death in our society.
- The major causes of early death have shifted from infectious diseases to chronic lifestyle related conditions. (Web)
- Healthy lifestyles are critical to wellness.
- Regular physical activity, sound nutrition, and managing stress are considered to be priority healthy lifestyles.
- The shift in causes of illness and the new emphasis on fitness, wellness, and healthy lifestyles has resulted in a shift toward prevention and promotion in addition to disease treatment.

The HELP Philosophy: The Facts

- The HELP Philosophy can provide a basis for making healthy lifestyle change possible.
- A personal philosophy that emphasizes Health can lead to behaviors that promote it.
- Everyone can benefit from healthy lifestyles.
- Healthy behaviors are most effective when practiced for a Lifetime.
- Healthy lifestyles must be adopted based on Personal needs.

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INFLUENCE OF EIGHT WEEKS AEROBIC DANCE TRAINING PROGRAMME ON SPEED AND AGILITY OF SCHOOL BOYS

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Abstract

The purpose of the study was to find out the influence of eight weeks aerobic dance training programme on speed and agility of school boys. To achieve the purpose of the study, randomly 15 boys had been selected from Swami Shivananda Higher Secondary School, Coimbatore. Their age ranged from 12 to 16 years. The selected subjects were assigned as Experimental Group: aerobic dance training group. Pre-test was conducted on speed and agility by using 50mt dash and shuttle run respectively. After pre-test experimental group has under gone eight weeks aerobic dance practice for one hour per day 5 days per week. After eight weeks of training programme post test was conducted and the readings were carefully recorded as post test score. To analyse the collected data paired't' test was used. The experimental group showed significant difference on speed and agility after eight weeks aerobic dance training programme. The study concluded that eight weeks aerobic dance training programme showed significant effect on speed and agility. Therefore the finding suggests that the aerobic dance is important for the development of speed and agility of school boys.

Key word: Aerobic dance, speed, agility, and school boys.

INTRODUCTION

Health and physical fitness have a vital role in the life of man. If a nation is to remain strong physically, mentally spiritually and socially there must be education for fitness. In this competitive world, many people find it hard to dedicate time for physical activities like exercises, although one of their first priorities is to stay healthy. In the worldwide, so many program and trainings are developing to keep people healthy. In this aspect aerobic dance is a fun activity that helps in strengthening your body, and gives you energy to carry out your day-to-day activities effectively and efficiently. Aerobic dance has become an extremely popular form of exercise. Over the past decade, the nature of this activity has evolved in several directions. The majority of the research pertaining to this form of exercise supports its application as a valid cardiovascular training.

METHODOLOGY

SELECTION OF SUBJECTS

To achieve the purpose of the study, randomly15 students had been selected from Swami Shivananda Higher Secondary School, Coimbatore. Their age ranged from 12 to 16 years.

SELECTION OF VARIABLES

INDEPENDENT VARIABLES

Aerobics dance training.

DEPENDENT VARIABLE

1. Speed
2. Agility

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EXPERIMENTAL DESIGN

The study was formulated as a single group design, consisting of a pre-test and post-test. The subjects (N=15) were randomly assigned. Pre-test was conducted on selected variables such as speed and agility. The readings were carefully recorded in their respective unit as pre-test score. After pre-test experimental group has under gone eight weeks aerobic dance training programme for one hour per day 5 days per week. After eight weeks of training post test was conducted and the reading were carefully recorded as post test score.Paired "t" test was applied to analyse the collected data.

CRITERION MEASURES

Table – 1: LIST OF AEROBICS DANCE STEPS

S1.No	Variables	Test Items	Unit of Measurements
1	Speed	50mt dash	In seconds
2	Agility	Shuttle run	In seconds

Marching chest open, V – step, V – step with clap, V – step with jump, Grapevine with arm action, Grapevine with knee lifting, Grapevine with clap, Forward kicking, A – step, Diamond step, L – step, Step out, Double step out, Back kick, V – step with, arm curl, T – step.

TRAINING PROGRAMME

Based on the literature available and the opinion of the experts the following training details were determined.

Duration of the training – 8 weeks
Number of days per week _ 5 days
Number of session per day – 1 session (1 Hour)

*Warming Up -10 Minutes, Dance 40 Minutes, and Cool Down -10 Minutes for recovery.

STATISTICAL ANALYSIS

Paired't' test was applied to find out the significance difference between the pre-test and post-test means of on speed and agility.

TABLE – II: SIGNIFICANCE OF MEAN GAINS / LOSSES BETWEEN PRE AND POST-TEST OF SPEED AND AGILITY

S.No	Variables	Pre-test Mean	Post-test Mean	Mean Diff	't'	Table value
1	Speed	8.86	8.72	0.14	4.64*	2.14
2	Agility	11.24	11.03	0.21	5.06*	

* Significant at 0.05 level (df 1, 14 = 2.14).

Table – II indicates that the obtained't' ratios are 4.64and 5.06 on speed and agility respectively. The obtained t-ratio ofspeed and agility are greater than the table value of 2.14, degrees of freedom of 1 and 14. It is observed that the mean gains and mean losses are statistically significant on speed and agility.

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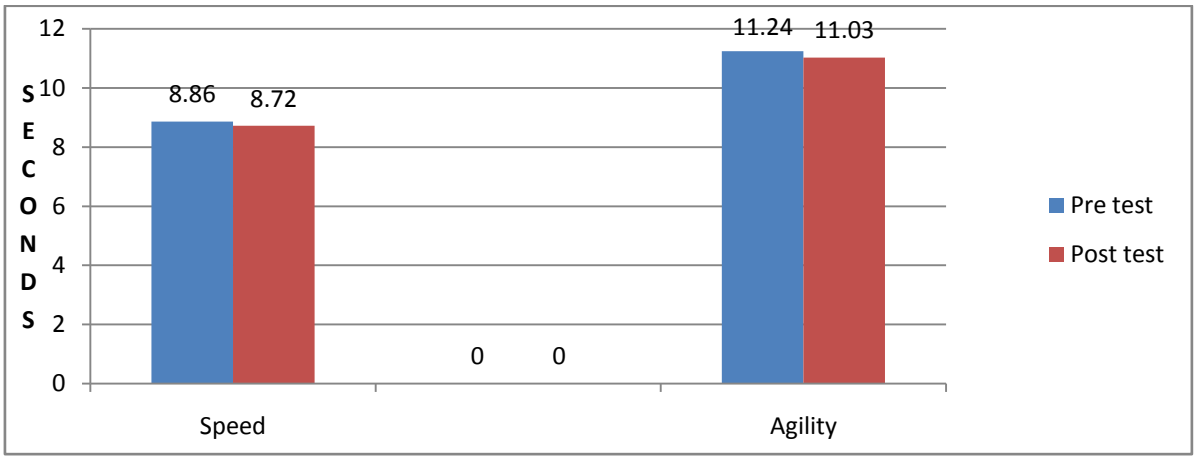

FIGURE- 1: BAR DIAGRAM SHOWING PRE AND POST TEST MEAN DIFFERENCES OF SPEED AND AGILITY

DISCUSSION ON FINDINGS

The purpose of the present investigation was to find out the influenceof eight weeks aerobic dance training programme on speed and agility of school boys.

In the present study, the results validate that eight weeks practice of aerobic dance showed significant changes on speed and agilityfrom baseline to post treatment. The present study also confirms that the aerobic dance is the superior training model to develop speed and agility of school boys.

CONCLUSIONS

Based on the results of the study the following conclusions were drawn.

1. Within the limitations and on the basis of the findings of the study, it was very clear that eight weeks aerobic dance training programme produced significant changes on speed of school boys.
2. It was also concluded that eight weeks aerobic dance training produced significant changes on agilityof school boys.
3. Further, it was inferred that aerobic dance training programme appears to be a safe and practical intervention tool for improving speed and agilityof school boys.

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EFFECT OF PLYOMETRIC TRAINING PROGRAMME AND CIRCUIT TRAINING ON SELECTED POWER PARAMETERS AMONG MEN VOLLEYBALL PLAYERS

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ABSTRACT

The purpose of the present study was undertaken to analyze the effect of plyometric training and circuit training on selected power parameters among men volleyball players. The investigator has selected sixty inter collegiate volley ball men players at random, their age ranged from 18 – 25 years. The subject chosen for the study were divided into three equal groups namely control group, plyometric training group & circuit training group. Group A is consisting of 20 men volley ball players underwent 12 weeks practices in plyometric training Programme and Group B is consisting of 20 men volley ball players underwent 12 weeks practices in varied circuit training whereas the control groups did not undergo any type of training. The data were collected before and after the training periods. The obtained data's were analyzed by analysis of covariance (ANCOVA). The level of significant was fixed at P< 0.05 level where ever the 'F' ratio was found significant differences among the paired mean. The results of the study showed that plyometric training and circuit training are significantly improved then the plyometric training and circuit training have similar effect in improvement in terms of horizontal explosive power and vertical explosive power of legs.

Key words: Plyometric Training – Circuit Training – Explosive Power, Horizontal - Vertical

INTRODUCTION

Plyometrics is known as jump training. It is a training technique designed to increase muscular power and explosiveness. Originally developed for Olympic athletes, plymetric training has become a popular workout routine for people of all ages, including children and adolescents.

Circuit training is a form of body conditioning or resistance training using high-intensity aerobics. It targets strength building and muscular endurance. An exercise "circuit" is one completion of all prescribed exercises in the program. When one circuit is complete, one begins the first exercise again for the next circuit. Traditionally, the time between exercises in circuit training is short, often with rapid movement to the next exercise.

Statement of the problem

The purpose of the study was investigating the "Effect of plyometric training and Circuit Training on selected power parameters among men volleyball players".

Hypothesis

It is hypothesized that there would be significant improvement differences on explosive power in terms of horizontal distance.

It is hypothesized that there would be significant improvement differences on explosive power in terms of vertical distance.

Methodology

The purpose of this study was to find out the influence of plyometric training and Circuit Training on power parameter variables namely explosive power in terms of horizontal and vertical distance. To achieve the

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purpose of this study sixty inter collegiate men volley ball players were selected random from Chennai district colleges. Their age ranged from 18 to 25 years. The subject chosen for the study were divided into three equal groups namely control group, plyometric training group & circuit Training group. Group A is consisting of 20 men volley ball players underwent 12 weeks practices in fitness training programme and Group B is consisting of 20 men volley ball players underwent 12 weeks practices in varied Circuit Training whereas the Control groups did not undergo any type of training programme other than their regular activities. Training was given five days in a week for 12 weeks. The subjected were tested on standing broad jump and vertical jump at the beginning (pre- test) and at the end of the experimental period (Post - test). To measure the horizontal and vertical distance, standing broad jump and sergeant jump were used respectively because of their simplicity and availability of necessary facilities, instrument and equipments.

Data Analysis

The data pertaining to the variables collected from the three groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance.

Training Schedule

Plyometric training schedule of the experimental group

Table A

S.No	Exercises	1 – 6 weeks				7 – 12 weeks			
		Rep	Set	Int%	Rec(Min)	Rep	Set	Int%	Rec(Min)
1.	Single Leg Hopping	15	2	40-50%	3-5	20	2	50-60%	3-5
2.	Bounding	15	2	40-50%	3-5	20	2	50-60%	3-5
3.	Plyometric Push ups	5	2	40-50%	3-5	8	2	50-60%	3-5
4.	Medicine Ball Throw	15	2	40-50%	3-5	20	2	50-60%	3-5
5.	Depth jumps	5	2	40-50%	3-5	8	2	50-60%	3-5
6.	Box drill	15	2	40-50%	3-5	20	2	50-60%	3-5
7.	Sit ups	15	2	40-50%	3-5	20	2	50-60%	3-5

Circuit training schedule of the experimental group

Table B

S.No	Exercises	1 – 6 weeks				7 – 12 weeks			
		Rep	Set	Int%	Rec(Min)	Rep	Set	Int%	Rec(Min)
1.	Step-ups	15	2	40-50%	3-5	20	2	50-60%	3-5
2.	Sit – ups	15	2	40-50%	3-5	20	2	50-60%	3-5
3.	Push - ups	10	2	40-50%	3-5	8	2	50-60%	3-5
4.	Squat jumps	15	2	40-50%	3-5	20	2	50-60%	3-5
5.	Shuttle runs	10	2	40-50%	3-5	8	2	50-60%	3-5
6.	Pull ups	15	2	40-50%	3-5	20	2	50-60%	3-5

Results and Discussions

The analysis of covariance on the data obtained for explosive power of horizontal distance of pre and post-test of GROUP A, GROUP B and CONTROL GROUP have been presented in Table I.

TABLE – I: ANALYSIS OF COVARIANCE OF DATA ON EXPLOSIVE POWER OF HORIZONTAL DISTANCE AMONG GROUP A, GROUP B AND CONTROL GROUPS

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(Standing broad Jump)

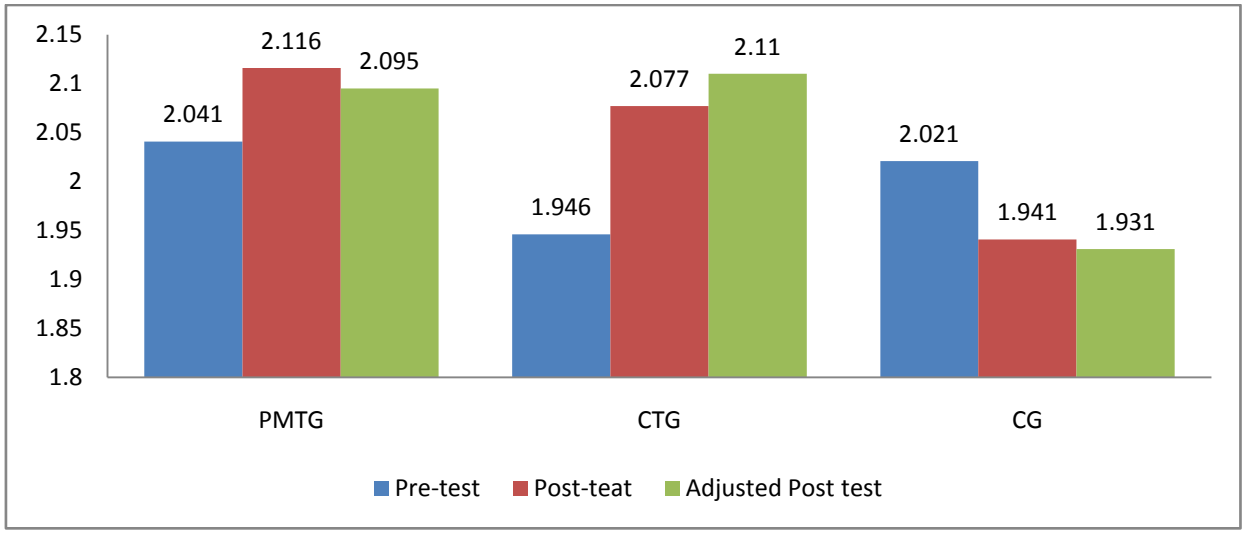
		GROUP (PMTG) A	GROUP (CTG) B	CONTROL GROUP	SOV	Sum of Squares	df	Mean Squares	"F" Ratio
Pretest	χ	2.0410	1.9460	2.0210	B	0.100	2	.050	1.399
	σ	0.2427	0.1535	0.1585	W	2.045	57	0.36	
Posttest	χ	2.116	2.077	1.941	B	0.338	2	0.169	9.267*
	σ	0.1210	0.1380	0.1446	W	1.038	57	0.018	
Adjusted post test	χ	2.095	2.110	1.931	B	0.390	2	0.195	29.375*
					W	0.372	56	0.007	

*significance at 0.05 level of confidence
F Value require d to be significant at 2, 57 d/f and 2, 56 =3.925

Discussion on the results of explosive power in terms of horizontal distance of pre and post-test :

The table shows that pre-test means of explosive power in terms of horizontal distance of PMTG, CTG & CG were 2.0410, 1.9460 and 2.0210 respectively showed an "F" ratio of 1.399 which indicates statistically 0.05 level significant differences. The post test means of explosive power in terms of horizontal distance of PMTG, CTG & CG were 2.116, 2.077 and 1.941 respectively resulted in and "F" ratio 9.267 indicates statistically significant difference between the post test means at 0.05 level of confidence. Similarly the adjusted means of explosive power in terms of horizontal distance between the groups are 2.095, 2.110 and 1.931 respectively resulted in "F ratio 29.375 which is higher than the table value of 3.925 with df 2 and 56 required for significance at 0.05 level. This indicates significant difference among the adjusted post test means of explosive power in terms of horizontal distance between the three groups.

The pre-test post test and adjusted post mean value of plyometric training; circuit Training group and control group on explosive power in terms of horizontal distance are graphically presented hereunder.



Explosive power of Vertical distance

The analysis of covariance on the data obtained for explosive power of vertical distance of pre and post-test of GROUP A, GROUP B and CONTROL GROUP have been presented in Table II.

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TABLE – II: ANALYSIS OF COVARIANCE OF DATA ON EXPLOSIVE POWER OF VERTICAL DISTANCE AMONG GROUP A, GROUP B AND CONTROL GROUPS (Vertical Jump)

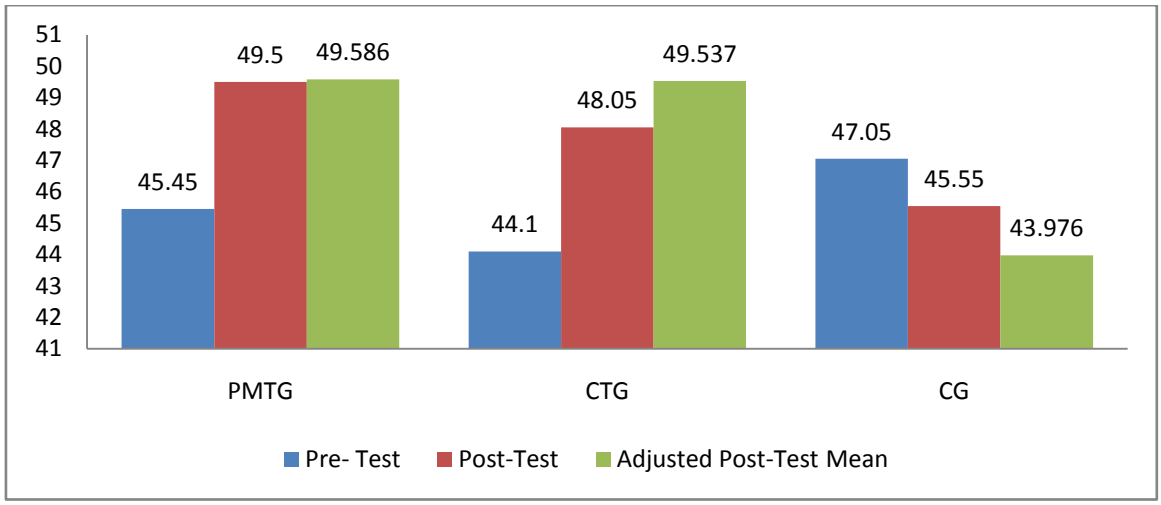
		GROUP (PMTG) A	GROUP (CTG) B	CONTROL GROUP	SOV	Sum of Squares	df	Mean Squares	"F" Ratio
Pretest	χ	45.450	44.10	47.050	B	87.233	2	43.617	0.208
	σ	5.771	5.418	4.285	W	1539.70	57	27.012	
Posttest	χ	49.500	48.050	45.550	B	159.700	2	79.850	2.670
	σ	5.771	5.707	4.8882	W	1704.900	57	29.911	
Adjusted post test	χ	49.586	49.537	43.976	B	398.548	2	199.274	238.93
					W	46.704	56	0.834	

*significance at 0.05 level of confidence
F Value require d to be significant at 2, 57 d/f and 2, 56 =3.925

Discussion on the results of explosive power in terms of vertical distance of pre and post-test:

The table shows that pre-test means of explosive power in terms of vertical distance of PMTG, CTG & CG were 45.450, 44.10 and 47.050 respectively showed an "F" ratio of 0.208 which indicates statistically 0.05 level significant differences. The post test means of explosive power in terms of vertical distance of PMTG, CTG & CG were 49.500, 48.050 and 45.550 respectively resulted in and "F" ratio 2.670 indicates statistically significant difference between the post test means at 0.05 level of confidence. Similarly the adjusted means of explosive power in terms of vertical distance between the groups are 49.586, 49.537 and 43.976 respectively resulted in "F ratio 238.93 which is higher than the table value of 3.925 with df 2 and 56 required for significance at 0.05 level. This indicates significant difference among the adjusted post test means of explosive power in terms of vertical distance between the three groups.

The pre-test post test and adjusted post mean value of plyometric training; Circuit Training group and control group on explosive power in terms of vertical distance are graphically presented hereunder.



Conclusions

The following conclusion were drawn from analysis of data

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1. Explosive powers in tearm of horizontal and vertical distance were significantly improved by the plyometric training group and Circuit Training group compared with control group.
2. Further this study reveals that not showed any significant differences between the plyometric training group and Circuit Training group on explosive powers in term of horizontal and vertical distance after twelve weeks of training programme.

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