CHAPTER-I
INTRODUCTION

The world of games and sports has crossed many milestones, as a result of different achievements in general and their application in the filed of sports in particular. Scientific investigation into performance of sportsman has been playing an increasingly importance role to attain excellence of performance in different sports.

Now the sports-man have been able to give out standing performance because of involvement of new scientifically substantiated training methods and means of execution of sports exercise such as sports techniques and tactics, improvement of sports grass, and equipment, as well as other components and condition of the system of sports training (Powel 1983).

Physiological and Anthropometric measurement and motor fitness variable play a vital role in almost all games and sports.

Sportsmen concentrate on the development of speed, strength, agility flexibility, endurance etc. as a part of preparation in their respective sports General motor abilities assist a sportsman in learning specific skills from a solid base over which he can develop excellence in the particular game he is involved (Dobbins, 1985).

Sports in 21st century have gained much popularity and prominence than in any other period of human history. Now it is become an absolute necessity that right talents are identified for the right same.

According to Thesis S Schanbal (1987) “Sports performance is the unity of execution and result of a sports action or a complex sequence of action measured or evaluated according to socially determined and agreed norms.” The sports performance is affected by various factors like body types, structure, ground surface, psychological variables, biological aspect, lake of fitness, body...
motion, equipment standard etc.

Sports in now no more a hobby it has become a full time profession. Modern sports infect compel athletes to take up sports competitions as a full time vocation besides making name and fame multi-disciplinary efforts are put together with the craze of taking human performance to it optimum possible level.

Performance in certain events and activities has already reached miracle increase in speed performance by 0.01 seconds seems to be different and challenging task.

In the present era development of science and technologies has revolutionized the field of sports. Every day the new records are being established in different sports activities. International level competitions sports presence bringing honour of for their countries the field of physical education and sports as also affected from such developments of science and technologies over the last century, and sports has captured an important place in the world. This is so because the application to the field of sports and physical education has enabled modern youth to develop physical capabilities beyond anything earlier imagined.

The sports scientists and coaches are demanding full time involvement and round the year dedicated practice of sports to reach the pinnacle of their performance.

The international community of sports lovers is also curiously looking for better and superb performance of sportsman and women in their respective fields.

Aspirations and expectations of the people pertaining to the performance of sportsman all over the world are going higher and higher. The high level of performance by sportsmen and require a highly scientific approach and it should be done right from the level of identifying talents.
1.1 **ANTHROPOMETRY**

One of the fundamentals of this approach is the study of human measurements or anthropometry. Anthropometry plays an important role in deciding the particular built of the body with various measurements of the body segments, suitable for a particular game and sports and essentially helpful to excel in that game.

Anthropometry is a branch of ergonomics that deals specifically with the measurement of people, particularly with measurements of body size, shape, strength and working capacity (Pheasant, S.T., 1998). This measurement data is used to describe or paint a picture of the user population for a particular measure of the body. By applying anthropometry, we attempt to design the working environment around the person, rather than placing constraints on them because they have to adapt to what is provided. If anthropometric factors are taken into consideration when products are designed, the outcome is likely to be increased acceptability, improved ease and efficiency of use, and therefore greater operational safety and cost effectiveness. When considering the design and use of equipment, the term ‘average person’ is often referred to and used. However, very few people would actually fit such a pattern. The body is made up anthropometrically of several functional parts, such as sitting height, forward grip reach, waist height and head circumference. Height is often used as a design criterion, but a ‘tall’ person can either have a long or short body and long or short legs. Thus, although many people will fit average garments (using clothing as an example), and garments can be sized to increase the probability of a reasonable fit, the efficiency of the garment or ensemble may be compromised, especially when free movement is further influenced by, for example, wearing breathing apparatus and a harness. When products are designed around the ‘average person’, many of the population are excluded from using them, since they fall well outside of this average.
Changes in body dimensions reflect the overall health and welfare of
individuals and populations. Anthropometry is used to assess and predict
performance, health and survival of individuals and reflect the economic and
social well being of populations. Anthropometry is a widely used, inexpensive
and non-invasive measure of the general nutritional status of an individual or a
population group. Recent studies have demonstrated the applications of
anthropometry to include the prediction of who will benefit from interventions,
identifying social and economic inequity and evaluating responses to
interventions.

Tanner (1964) pointed out that it might be assumed that an individual’s
physique and body composition either greatly limits or in some instance, pre-
 disposes that individual, successful participation in one activity or another.
According to Motto (1977) Performance depends upon inherited characteristics
like height and limb lengths etc.

Anthropometry can be used for various purposes, depending on the
anthropometric indicators selected. For example, weight-for-height (wasting) is
useful for screening children at risk and for measuring short-term changes in
nutritional status. However, weight-for-height is not appropriate for evaluating
changes in a population over longer time periods. A clear understanding of the
different uses and interpretations of each anthropometric indicator will help to
determine the most appropriate indicator(s) for program evaluation. For more
detailed explanations of age and sex specific appropriate anthropometric uses.
Key terms are defined in the glossary.

The four building factors or measures used to undertake anthropometric
assessment are:
1. Age
2. Sex
3. Length
4. Weight
Each of these variables provides one piece of information about a person. When they are used together they can provide important information about a person’s nutritional status. The actual measurement of age, weight and height of children requires specific equipment and techniques which are described later. When two of these variables are used together they are called an index. Three indices are commonly used in assessing the nutritional status of children:

- Weight-for-age;
- Length-for-age or Height-for-age;
- Weight-for-length or Weight-for-height.

There are many other anthropometric measures including mid-upper-arm-circumference (MUAC), sitting height to standing height ratio (Ceramic Index), and many skin fold measures. This guide will concentrate on the measurements and interpretation of weight and height in children. Anthropometric measurements were central concerns of the first phase of the scientific era of measurement began in 1860.

Current interest in anthropometric measurements on these areas, growth measurements body types and body composition, prediction of growth pattern and prediction of success in motor activities as well as assessments obesity.

**How do we use anthropometric data**

The aim of applying anthropometry is to accommodate as many of the user population as possible. If we look at a particular anthropometric measure, such as female stature, we find that most individuals will be of average stature, and there will be fewer individuals who are very tall or very short. The horizontal axis shows a person’s height (stature) and the vertical axis shows how many people would be of a particular height, or the frequency with which they occur in the sample of people you are measuring. For this reason, this type of graph is called a frequency distribution.
When an anthropometric measure produces a symmetrical curve like the one above, the average (or mean) value is also the 50th percentile value. This means that 50% of the people you are measuring are shorter than this value and 50% are taller than this value. The line on Figure 1.3.1 marked 5th percentile denotes that 5% of the people you are measuring (i.e. 1 in 20) are shorter than this value. Similarly, the line marked 95th percentile denotes that 5% of the people you are measuring (i.e. 1 in 20) are taller than this value. Therefore, 90% of the people you are measuring have a height between the 5th and 95th percentile values. When designing products, this is often referred to as providing for the middle 90% of the population; that is to exclude the smallest 5% (5th percentile figure) and the largest 5% (95th percentile figure). This is done because accommodating those people with measures at the tail ends of the distribution would drastically increase the length of that variable, and may mean the product will become very complex and costly. Usually, it is easier to cater separately for those people that fall below the 5th and above the 95th percentiles with tailor-made or specially adapted items. However, in critical situations a safety margin must be added to the extreme percentiles. For example, any gaps in a machine guard must be smaller than an ungloved 1st percentile finger/hand from the user population. Methods of escape must be wider than a fully clothed person (including PPE and relevant equipment) with a 100th percentile shoulder (bi-deltoid) width from the user population (this will usually be a male).

Many anthropometric measures, such as female stature, produce a symmetrical, bell-shaped curve like and these measures are said to have a normal distribution. The exact shape of the normal distribution depends on the mean and the standard deviation values for the set of people being measured. The standard deviation is a measure of spread and indicates the amount of departure of the values from the mean, so differences in standard deviation create the shape of the distribution. Although the distribution remains
symmetrical, the distribution becomes flatter if we increase the standard deviation. A useful piece of information is that if an anthropometric measure is normally distributed, we know that approximately 68% of those people measured will lie within one standard deviation either side of the mean (±1SD) and approximately 95% will lie within two standard deviations either side of the mean (± 2SD).

1.2. PHYSIOLOGY

Physiology is defined by dictionaries as ‘the science of the normal functions and phenomena of living things’.

Historically, the subsequent meaning of ‘physiology’ is well illustrated by the way in which the word is used in the two following quotations. The first is from 1704 (J. Harris, Lexicon Technica): ‘Physiology, is by some also accounted a Part of Physic’ (i.e. Medicine), ‘that teaches the Constitution of the Body so far as it is sound, or in its Natural State; and endeavours to find Reasons for its Functions and Operations, by the Help of Anatomy and Natural Philosophy’. The second (a definition of Charles Darwin's colleague T. H. Huxley), 150 years later, is virtually identical to current usage: ‘whereas that part of biological science which deals with form and structure is called Morphology; that which concerns itself with function is Physiology’.

Physical variables may be defined as those variables which are performance oriented and dependent upon functioning of different systems of the body in integrated manner (Toor 1996).

Clarke (1978) has thus exhorted that physical fitness is a vital biological need. The neglect of which handicaps the total effectiveness of the individual. Physical fitness is not only essential for total effectiveness of all individuals but also of paramount importance to sportmen.

Harder to define, yet critical to the discipline of physiology, is the term ‘general physiology’. This subject emerged originally from the convergence of
nineteenth-century physical chemistry with experimental biology. It was founded on quantitative studies of plant and animal cells. Because of its reductionist goal, general physiology was an obvious forerunner of what is now described as cell and molecular physiology. However, more than this, it attempted to use the theoretical insights gained from the ‘hard sciences’ (physics and chemistry) to provide a rational basis for analyzing living matter, and was thus eager to embrace and test theory quantitatively. An outstanding example of the success of this approach is the experimental analysis of the resting potential and the action potential (nerve impulse) by Hodgkin and colleagues in the late 1940s. Indeed, successful analysis of ‘bioelectricity’ is one of the factors that led to the foundation by physiologists of yet another offshoot — biophysics. Although there are still (notably in North America) a number of distinguished university departments of Biophysics, growth of this subject as an independent discipline has been hampered somewhat by its failure to meld its ‘physiological’ roots with its links to biological physics (especially X-ray crystallography). However, the work of Nobel laureates Neher and Sakmann provides a spectacular example of how electrophysiological analysis can give biophysical insight not available through other means. These scientists, through clever technical developments, were able to design experiments that allowed structural, and hence functional, changes in single protein molecules (membrane ion channels) to be followed in real time by recording the flow of ionic current through them. By tightly sealing a fine, fluid-filled capillary tube to an extremely small part of a cell membrane, and linking it to a sophisticated amplifier (‘patch clamping’), they were able to measure the current through individual channels, flicking quickly from closed to open states. This physiological insight has very recently been matched by structural studies by MacKinnon and colleagues on membrane channels at atomic resolution.
Physiology has a complex, deep relationship with the approach of reductive science. This is in part because ‘function’, particularly ‘interesting’ or unexpected function, emerges from interactions that can be found only in relatively complex systems; hence physiologists are unlikely (unless they are working on essentially trivial problems) to find that molecular structures in isolation give more than partial insight into the problem under attack. ‘Explanations’ of physiological questions seem more likely to arise from combining such reductionist approaches with, on the one hand, thermodynamics and, on the other, control systems theory. Life depends on ‘non-equilibrium’ properties — i.e. on complex interactions that require the constant expenditure of energy to maintain them. And networks of information and control (the nervous system, hormones etc.) are central to the development, function, and probably the evolution of complex biological systems.

Seen in this way, the information encoded in the genes provides a very challenging experimental opportunity for physiologists. To have read the sequence of DNA is only a small step on the route to understanding how and to what extent our genes build and control our bodies, and cause disease. Genes do just one thing: they translate their information into proteins. To understand how the products of genes work individually and together to create the magnificent complexity of a whole organism is part of the exciting challenge that faces the revitalized science of physiology in the twenty-first century. Indeed, the prospects for physiology are wider still: it will ultimately need to link such understanding ‘upwards’ to such disciplines as experimental psychology, ecology and human biology.

**Physiological Parameters**

Physiological parameters may be defined as those parameters which are directly linked with various physiological systems and may be voluntary or
involuntary, such as pulse rate, haemoglobin; blood pressure and vital capacity etc.

Physiological parameters have very serious implications on the health and well being of individuals. It is defined as the degree of task under specific ambit conditions. Most authors define physical fitness as a capacity of carrying out every day activities i.e. work and play without excessive fatigue and with enough energy in reserve for emergencies.

1.3 KABADDI

Kabaddi is aptly known as the “Games of The mass” due to its popularity, simple, easy to comprehend rules, and public appeal. The game calls for no supplicated equipment what so ever, which it very popular sport in the developing countries. Though it is basically an out door sport played on clay court, of late the game is being played on synthetic surface indoors with great success. The duration of the game if 45 minutes for men & junior boys with a 5 minutes break in between for the teams to change sides in the case of women/girls & sub-junior boys, the duration of 35 minutes with a 5 minute break in between Kabaddi is a combative team game, played with absolutely no equipment, in a rectangular court, either outdoors with seven players on the ground in each side. Each side takes ultimate chances at offence and defense.

The basic idea of the game is to score paints by raiding into the opponents’ court and touching as many defense players as possible without getting caught on a single breath. During play, the players on defensive side are called “antis” while the players of the offense is called the “raider.”

Kabaddi is perhaps the only combative sports in which attack is an individual attempt while defence is a group effort. The attack in Kabaddi is known as “raid.” The antis touched by the raider before the returns to how court. These players can resume play only when their side scores points against
the opposite side during their raiding turn or if the remaining players succeed in
catching the opponent’s raider.

Yoga, the Indian science to control body and mind through meditation
and self-control players an integral part of Kabaddi. The raider has to enter the
opponent’s court chanting the word “Kabaddi” while holding his breath and
has to continue to do so until he returns to his home court. This is known as
“cant” which is closely related to “pranayama” of yoga. While Pranayama is
about with holding breath in order to exercise internal organs, cant is the means
to with hold breath with vigorous physical activity. This is perhaps one of the
few sports to combine yoga with hectic physical activity.

The game calls for agility, good lung capacity, muscular co-ordination
presence of mind and quick responses. For a single players to take on seven
opponents is no mean task, requires dare as well as ability to concentrate
anticipate the opponents moves.

**Origin**

The sport has a long history dating back to pre-historic times. It was
probably invented toward of group attacks by individuals and vice-versa.

The game was very popular in the southern part of Asia played in its
different forms under different names. A dramatized version of the great Indian
epic, the “Mahabharta” has made an analogy the game to tight situation faced
by Abhiman’s the heir of the Pandava kings when he is surrounded on all side
by the enemy.

Buddhist literature speaks of the Gautam Budha playing for recreation.
History also revels that princes of your played Kabaddi to display their strength
and win their brides.

The game, known as Hu-Tu-Tu in western India, Ha-De-Do in eastern
India’s Bangladesh, Chedugudhu is Southern India and Kaunbada in northern
India has undergone a sea change through the ages. Modern game Kabaddi is a
synthesis of the game played in its various forms under different name.
Forms of Kabbadi

Amar: Amar literally means invincible. This is form of Kabaddi, which is played based on points scored by both sides. The play field has no specific measurements and nine to eleven players constitute each of the teams.

In this form of Kabaddi, there is no ‘out’ and ‘revival’ system or ‘Lona’ but time is deciding factors. The main advantage of this form of the game is that the players remain in court through out the match and are able to give their best performance.

Gemini: This form of Kabaddi is played with nine players or either side, in a playfield of no specific measurements. The principle characteristics of this form of Kabaddi is that a player who is put out has to remain out until all his team members are put out. The team that is successful in putting out all the players of opponents side secures a point. This a akin to the present system ‘of Lena.’ After all the players are put out, the team is revived and the game continues. The game continues until five or seven ‘Lena’ are secured. The game has no six time. The main disadvantage of this form of Kabaddi is that the players is not in position to give his best performance since he is likely to remain out for the better part of the match until a Lena is secured.

Sanjeevni

This form of kabaddi is closed to the present game. In this form Kabaddi, players are put out revived and the game lasts for 40 minutes with a 5 minutes break in between.

The team consists of nine players of each side. The team that puts out all the players on the opponents side scores four extra points for a ‘Lena.’ The winning team is the one that scores the maximum number of points and the end of 40 minutes. The present form of Kabaddi is a synthesis of all these forms of Kabaddi with a good number of changes in the rules and regulation.

Kabaddi attained national status in the year 1918. Maharashtra was the pioneers state to bring the game to the national platform and give it further
popularity standard rules and regulations were formulated in 1918 but were brought out in print in the year 1923 in this very year an all India tournament was organized all over the country through out the year.

Kabaddi received its first international exposure during the 1936 Berlin Olympics, demonstrated by Hanuman Vyayam Parsarak Mandal, Amravati, Maharashtra. The game was introduced in the Indian Olympic games at Calcutta, in the year 1938.

It was in 1950, that the all India Kabaddi federation come into existence. Regular conduct of national level championship as per laid down rules and regulations.

Began with effects from the year 1952 after the formation of Amateur Kabaddi federation of India, the first men’s nationals were held in Madras (Now re-named Chenni), while the women’s nationals were held in Calcutta in the year 1955.

The rules were modified and some changes were introduced to the game during the national championship held at New Delhi in the year 1954. Efforts were made to demonstrate the game in the world youth festival held at Moscow in the year 1957. But due to various unforeseen reasons, this could not be accomplished. The game was included in the curriculum of the Indian University Sports control board as main sports discipline in the year 1961.

The game for further recognition when the school games federation of India included it in the school games the year 1962. This body has taken up the responsibility of organizing state and national level competition for school going children all over the country in various sports on a regular basis, every year.

The Amateur Kabaddi Federation of India the new body came into existence in the year 1972. The body was formed with a view to popularize the game in the neighboring countries and organize regular national level Men and Women tournaments. After the formation of this Kabddi, sub-junior and junior
sections were included in Kabaddi national level tournaments, as a regular further.

Kabaddi was included in the curriculum of regular discipline course in coaching conducted by the national institute of sports, the premier institute to develop sports in the country with effect from the year 1971. Thereafter, qualified coaches in Kabaddi are being produced every year. The neighboring countries, Nepal & Bangladesh also send their coaches for the diploma course in various disciplines including Kabaddi, regularly. These qualified coaches are equipped to train players at different levels in a systematic manner with sports science back up.

In the year 1974, the Indian men’s team toured Bangladesh as part of the cultural exchange program to play five test matches in different parts of the country. The Bangladesh returned the visit in the year 1979 and played five test match in India.

The Asian Amateur Kabaddi federation was formed in the year 1978, during the silver jubilee celebrations of National Kabaddi Championship in India organized at Bhilai, Madhya Pradesh. The first Asian Championship in Kabaddi was organized in Calcutta, in the year 1980. A goodwill tour was organized in the year 1981 in which, the Indian men & women teams visited Thailand, Japan and Malaysia to play exhibition Kabaddi matches. Federation cup Kabaddi matches also commenced in the year 198.
Kabaddi was included as a demonstration game in the IX Asian Game hosted by India in the year 1982. In the year 1984, an open international tournaments was organized at Bombay (Now renamed Mumbai), in India. During the Tri centenary celebrations of the city of Calcutta, an inter-national invitation Kabaddi tournaments was organized in the city.

The South Asian Federation included Kabaddi as a regular sports discipline from the year 1984. Kabaddi was played for first time in the SAF Games, which is played every once in two years. For the first time in the International Kabaddi scenario, India faced defeat at the hands of Pakistan and had to be satisfied with second place, wining the silver medal, in the VI SAF Games at Dhaka, Bangladesh, in the year 1993.

The second Asian Championship was hosted by India and organized at Jaipur, Rajasthan, Malaysia and Japan participated for the first time in this championship in the XI Asian Games held in the year 1990 at Beijing, China.

Kabaddi was included in the main disciplines. This was a major landmark in the history of Kabaddi, India won the Gold Medal, which was a proud and Unforgettable moment for Kabaddi lovers who had strived to bring Kabaddi to the Asian platform. India has been the reigning champion in the succeeding Asian Games held in 1994 at Hiroshima, Japan and in the Asian Games held in 1998 at Bangkok in Thailand.

An-International women Kabaddi tournaments commenced in the year 1995. called the Nike Gold Cup, Sponsored by Nike, Japan. The III Asian Championship was hosted by Sri-Lanka in the year 2000. For the first time, Sri-Lanka secured a silver medal defeating Kabaddi steelworks Pakistan, in this championship.

Kabaddi will be introduced to the African countries as a demonstration sports in the Afro-Asian Games which is to be hosted by India in the year 2002. This is a feather in the cap for Kabaddi lovers and has been made possible
thanks to the efforts of Mr. J.S. Gehlot president, Amateur Kabaddi Federation of India and the Indian Olympic Association ………

**Development of the Game**

There is a gradual but marked change in the style of game during the past 50 years. What was once considered a game of brown is not so now. The introduction of more techniques to the game has made it relatively easier for a players with more skill than weight to score points against better-built opponents.

Over the year, the game pattern changed along with the rules and the size of the play field. The concept of Kabaddi as an Indigenous game of India first came up during the year 1921 in Maharashtra, when a certain framework of rules was prepared and the game was played an the pattern of Sanjeevni & Gemini in a combined form. A special committee was constituted in 1923 which amended the rules. These rules were applied in all India Kabaddi Tournament organize during the same year.

It was Hanuman Vyayam Parsark Mandal, Amravati, Maharashtra, which took up the task of organizing and developing Kabaddi in a more systematic and scientific manner.

This institution believes in the maximum “A healthy mind in a healthy body” and has been doing yeoman’s service to sports in general and Indigenous games in Particular, over the years. During the year 1927 to 1952, Kabaddi was played in different parts of the country based on rules framed by the various club and organizing committees, which mushroomed had gained in prominence. Three were frequent disputes over the rules during tournaments owing to lack of uniformity in the rules and regulations followed in various parts of the country.

In Maharashtra, the pioneering state to regularize the game and bring it to the national platform, Kabaddi, which was known as “Hu-Tu-Tu”, was played according to the rules framed by the Decan Gymkhana from 1928 to
1938. The introduction of the game to the international arena as a demonstration game in the 1936 Berlin Olympics led to the inclusion of Kabaddi in the list of priority game of the Indian Olympic committee, in the year 1940. Thereafter, inter-provincial Kabaddi tournaments were organized bi-annually.

The matches at the district and provincial level were played as per the rules framed by the Akhil Maharashtra Sharirik Shiksan Mandal, while the inter-provincial championships were based on Buck’s rules of games and sports, published by Mr. H.C. Buck Founder principle of YMCA College of Physical Education, Madras. The Indian Olympics Games were re-named as National Games in the year 1952 and are since being organized once in a year instead of bi-annually.

The All India Kabaddi Federation, which was formed in the year 1952 appointed a “Rules Sub-Committee” with the express purpose of laying down standard rules and regulations to be followed by affiliated provincial units all over the country. A new set of rules framed by the rules sub-committee based on Buck’s rules and the game rules followed till then by the Abhil Maharashtra Sharirik Shiksan Mandal.

The games pattern also changed over the years along with the standardization of rules and regulations. The Asian Kabaddi Federation was sounded under the chairmanship of Mr. Janardan Singh Gehlot. Asian
Amateur Kabaddi Federation is now headed by Mr. Janardan Singh Gehlot as President and Mr. Muhammad Sarwar as secretary General.

Kabaddi was introduced and popularized in Japan in 1979. The Asian Amateur Kabaddi Federation sent Prof. Sunder Ram of India to tour Japan for two months to introduce the game. In 1979, a return test between Bangladesh and India was held at different places of India including Mumbai, Hyderabad and Punjab. The Asian Kabaddi Championship was arranged in 1980 and India emerged as champion and Bangladesh runner up Bangladesh became runner up again in 1985 in the Asian Kabaddi Championship held in Jaipur, India. The other teams I the tournaments were Nepal, Malaysia, and Japan. The game was included in the first time in the Asian games in Beijing in 1990. India china, Japan, Malaysia, Sri-Lanka, Pakistan and Bangladesh took part India won the gold medal and has won gold at the following four Asian games in Hiroshima in 1994, Bangkok in 1998, Busan in 2002 and Doha in 2006. Attempts to popularize kabaddi; in Great Britain saw British TV Network Channel 4 Commission a programme dedicated to the spark. The snow, kabaddi, on channel 4 in the early 1990s, failed to capture viewers despite fixtures such as West Bengal Pol versus the Punjab was axed in 1992. But now before its presenter Krishan Guru-Murthy suffered a collapsed lung while participating in the sport.
In the 1998 Asian games the Indian Kabaddi team defeated Pakistan in a thrilling final match at Bangkok (Thailand). The chief coach of the team was former Kabaddi Player and Coach Flt. LT. S.P. Singh.

Kabaddi in now a very popular game and is a regular sport in Asian Games, Asian Indoor Games and Asian Beach Games apart from SAF Game. Kabaddi will be a demonstration sport during commonwealth games 2010 at New Delhi.

The first Kabaddi Men World Cup Tournament was hosted by India in October, 2004 at Mumbai. The first Asian Women championship was held Hyderabad in 2005. The second Kabaddi World Cup Tournament was also held at Panvel Mumbai, 2007. Recently another landmark in the field of Kabaddi, the Women’s Kabaddi team participated in SAF games 2009 and won gold medal. Both men and women Indian Kabaddi teams won gold medals in 16th Asian Games held at Guangzhou, China (2010). The first kabaddi Premier League (KPL) Championship 2011 was hosted by Dandmudi Rajagopal Rao Indoor Stadium Vijayawara. Indian women team won gold medal in first world cup held at Patliputra sports complex Patna (Bihar) on dated 1march to 4march 2012. It is a matter of pride that Indian men and women teams won gold medal in all inter national Kabaddi tournaments.

**Beach Kabaddi**

This form of Kabaddi; is very new invention of Indian Lover (People). The basic concepts about rules are same of both modern Kabaddi and Beach Kabaddi, Beach kabaddi played on sandy surface while modern kabaddi played an hard surface and synthetic (met) surface. The first Beach Kabaddi senior national, Men/women has conducted by Andhra Pradesh in 2003. Punjab was winner both men and women section.
To develop and promote the sport of Kabaddi

Rules of Beach Kabaddi

The game of beach Kabaddi shall be governed and played under the following rules of Asian Beach Kabaddi Federation.

Ground

Ground shall be levelled at a sea beach, river bed or with sand of minimum 30 cms of depth.

Play Field Measurements

Men 11×7 meters divided in to two equal halves by a mid lin. Men Below 80 kg. weight & have some photos of Beach Kabaddi, from the 2008 Asian Beach Games, Held in Bali.

It is played with 4 Antis on a side, the rectangular playground seems proportionally smaller than that of the indoor style (played with 7 Antis on a side).

So, I guess the rules are some what different because of the different numbers of players and the smaller court.

The time duration of the game is reduced to 2×15 mn, with internal mm. There in not any apparent Bonus line in Beach Kabaddi.

I would like also to know the exact dimensions of the playground, but I can not find any information about that. (The official site has the beach Kabaddi page under construction).

I have read in an older article that Beach Kabaddi was then being played with 6 Antis. And differently than the Indoor format, one an Anti was touched,
he was not eliminated from the party is this rule still the same in Beach Kabaddi. Today I understand that there has been continual experimentation, and adaptation of the format depending on the importance of the event. In the perspective of going into international (like actual Asian Games) and Olympic Games, there is a necessary reflexion on the appropriate format that has been done by the official federation.

**Circle Kabaddi**

The game of kabaddi is one of the oldest games of Indian origin. As you know the game has been playing for a long time (about the thousand of years ago) in India Circle Kabaddi is a 4000 year old game.

It was properly invented to be group attacks individual and vice versa. Game was very popular in the southern parts played in its different forms of circle kabaddi. The sports of circle kabaddi have a long history dating back to play historical times a dramatized version of the great Indian epic. Mahabharata, has made in analogy of the game a tight situation faced by Abhimanu, Pandava king, when he was surrounded by the entire enemies. The Indian epic, Shivpurana gives the evidence of battle between Lord Shiv with demons to protect Devtas for maintaining Goodness and humanity. Again transforming with the ages “The Hanuman” of Ramayana times is the great epitome who did remove each and every obstacle by his strength, vigour, during fight with Ravana.

Further, in Mahabharata times, different kings like Jarasandh, Bhim, Balram, Krishna, Abhimanyu, Kansa, Daryodhana, etc are few examples who make the history of great battle by performing rules of fight. The king Chandergupta, Krishna Devaya, Prithviraj Chauhan are further great examples for maintaining tradition of Kabaddi in form of sports as well as battle. Again, the Mughal Dynasty has seen overwhelming examples traditionally played across the country under different umpires. The British under his rule observed
great face of “Gama” Pehalwana and associates of his times and finally transforming today’s words.

The great heroes as Dara Singh, Harjeet Singh Brar, Bhalwinder Phidoo, Bhima, Khali who poses the spirit of this sports.

So, the origin of Kabaddi poses infinite changes in the history of Indian scenario and the popularity of this game is a rural indigenous origin draw charms and identity for great performance about mix blend of human strength, sound mind, concrete spirit, decision making ability and in the last human satisfaction circle kabaddi is a mainly the game which requires athleticism, skill, speed, stamina, and agility. It has the capacity to become a popular sports of the Asian continent and all the other continent of the world. The days are not very for, when Asian circle style kabaddi will be part and parcel of the Asian games a quadrennial sports extravaganza held in different countries of this continent.

In addition to above, circle style kabaddi is very popular in England, Canada, USA, South Korea, Japan, UK, Nepal, Pakistan and other countries of the world. Asian style circle style kabaddi has planned to starts its place in European countries as well as in from and Afghanistan. However, at places body styles of this indigenous game, which does not cast any amount, rather it is cheaper game of masses throughout the world especially in villages. Circle Kabaddi having its own more numbers of clubs than any other sport in India. In Maharashtra, Punjab, Haryana, Delhi, J&K, Tamil Nadu themselves there are more than 1000 clubs. Regular interclub’s tournaments take place and attraction cash prize are awarded in the big tournaments. This is probably the only combative sport in which offence is a man to man attempt, while defence is a group efforts.

This indigenous and national game of India has long history and popularity which further needs support for its developments all over the world. We can take the examples of countries like Japan, South Korea, etc. who have
successfully launched indigenous sports such as “Judo” and “Tai-Kwondo” in the sport all over the world. Circle Kabaddi game is very interested master rule game. Now, at its best and this sport is going to introduce in Olympic charter by world Kabaddi federation (WKF).

All India Circle Kabaddi Federation (AICKF) affiliated with World Kabaddi Federation (WKF) is a self propelled & seal with experience since 2006 conducting practice of circle kabaddi at national level got affiliation with world kabaddi federation which plays a pivotal role for promoting Kabaddi game and will provide information, organizing events & tournaments, workshop consultative to its members all over India. Further intrinsic spirit of the federation gave new pathway to development and growth to achieve great height of international standards by channelising resources.

The first world kabaddi championship was held in Hamilton, Canada, when 14,000 people at the copps coliseum watched top players from India, Pakistan, Canada, England and the united states. The next edition was in surrey. British Columbia, which hosts the first all kabaddi stadiums. India has remained world champion since it was included in Asian Games and South Asian federation games. In 2008 Sukhbir Singh Badal mooted a professional world Kabaddi league with sponsorship to attract the best players. This league will Besides being based in India with tournaments in Canada as well as one of the many great of the game of kabaddi is one grant Owens, a 3 time kabaddi world champion (Twice with England, once with the outer Hebrides). Once of the skills that make Owens such a great player, is his low centre of gravity and his rumoured 7 litre lung capacity.

1st Pearl Kabaddi Word Cup (2010) held in Punjab Organized by Parkash Singh Badal eleven country participate this word cup. India is the winner & Pakistan is the runner up team in this word cup. 2nd pearl kabaddi word cup (2011) also held in Punjab in this word cup first time participate the women section teams 14 teams participate in women section. India is the
winner team both the section. Canada is the runner up team in men section & UK is the runner up team in women section.

Table 1.1: Results of Kabaddi World Cup to date:

<table>
<thead>
<tr>
<th>Year</th>
<th>Teams</th>
<th>Scores</th>
<th>Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>India vs. Iran (NS)</td>
<td>55 – 27</td>
<td>India</td>
</tr>
<tr>
<td>2007</td>
<td>India vs. Iran (NS)</td>
<td>29 – 19</td>
<td>India</td>
</tr>
<tr>
<td>2010</td>
<td>India vs. Pakistan (CS)</td>
<td>58 – 24</td>
<td>India</td>
</tr>
<tr>
<td>2011</td>
<td>India vs. Canada (CS)</td>
<td>59 – 25</td>
<td>India</td>
</tr>
</tbody>
</table>

1.4 KHO-KHO

Kho-Kho, an ancient game of undivided India, Probably was derived from the different strategy and tactics of “Kurukshetra” was in Mahabharata. The chariot fifth during the war and zigzag pathways followed by the retreating soldiers indicates the formation of chain play a defense skill in the game of Kho-Kho. On the 13 the day of war, the chief of Kaurav Army, Guru Dronacharaya drew a typical strategic formation chakrabyuha keeping Jayadratha in main entrance with 7 soldiers to draw in and kill the enemy. Bir Abhimannya, the son of Arruna, Entered into the trap but could not get his away out and in the process got killed. He fought gallantly alone against 7 soldiers adopted by Abhumannya resembles the idea of Ring play a defense tactics in Kho-Kho game.

In the year 1936, during the event of Berlin Olympic one Kho-Kho team from Pune exhibited the salient feature of the game of Kho-Kho in Berlin. Kho-Kho, based on natural principals of physical development, fosters a healthy combative spirit of team understanding. Asian championship ’96 was held in ‘tera flex’ court at Kshudiram Anushilan Kendra, Kolkata.
Asian Kho-Kho federation (AKKF) came into being after the demonstration game during 3rd SAF Games held in Kolkata in 1987. Kho-Kho made its entry into international sports area in a first Asian Kho-Kho Championship 96 held at Kolkata in 1996 under the Auspices of AKKF & KKFI and organized by the west Bengal Kho-Kho Association (WBKKA), India and Bangladesh were the winners and runner up respectively. The participants are Bangladesh, Pakistan, Sri-Lanka’s Nepal and host India. In 2nd Asian Kho-Kho Championship in Dhaka 2000 India, Sri Lanka, Pakistan, Thailand, Japan and host Bangladesh participated.

The game of Kho-Kho is based on natural principals of physical developments. It is vigorous and fosters a health combative spirit among youth. It is not merely running with speed but its CHASE a natural instinct to overtake, to pursue to catch a kill. No doubt speed is the heart and to stand to a relentless pursuit of a minutes at a stretch (turn) this heart demand stoutness stamina. In turn a physically fit youth enjoys it and the spectators who watch enjoy a trilling sport to their satisfaction. The game is played in two innings. A team consists of 15 players. However 12 players are nominated for a match and only a take to the actual game initially. Every team has to chase and defend for
a minutes each twice in a match that thus consists of a 2 innings. Chasing or defending once in an inning is termed a “Turn” of the particular act.

There is a rest of a minute in between two innings and 5 minutes in between two turns for a change over. Controlled sprinting Dodging, dividing are few skills exhibited during the game which won by a team that scores more points (one point is awarded for away defender, who is out). The game can be played on any surface that suits open field sports. As on today it is played on grounds prepared from or earth or even on turf. Needless to say that synthetic ground and playing indoor is no card.

Through are nature of two game Kabaddi “Kho-Kho” seems to be similar yet there is some difference in skills and nature a activities of the two games. The size of court definitely denominates the difference in playing situation in the two games. As a matter fact, different qualities such as strength, speed, endurance, agility, co-ordinate balance, turning abilities. The best performance of sports person in kabaddi and Kho-Kho or any other games greatly depend upon various factors such as physical fitness, skill perfection, technical, understanding, psychological, anthropometry, sports medicine, social and physique (as physiology, morphology, Body composition factors) in which physique and physical fitness components are the physical educators and trainers are mere interested in physiology and anthropometry as it pertains to the selection of some problems in the field, for example has deviation in height seriously influence performance in tests in separate area? Should body build Besides being reviewed to clarify standard sports training’s. the human body, size and from varies in a variety of ways and depend upon sex, age race and geography one of the main concerns of the physical anthropology and human physiology is to acquire and convey he knowledge on the true way and reasons of individual variability and differentiation.

Anthropometry and physiology play an important role in deciding the particular build of the body with various measurements of the segments of the
body it has also its importance in the field of Kabaddi and Kho-Kho game. Some what or altogether the body height length of various level and measurements of the varies body segments, pulse rate blood pressure Haemoglobin, vital capacity and body composition have definite effects on the performance of these game players. The investigator in the present study made an effort to test this hunch to compare the difference between the various physiological and Anthropometrical measurements of Kabaddi and Kho-Kho players.

1.5 STATEMENT OF THE PROBLEM

The present problem is stated as a “Comparative study of Selected Physiological and Anthropometrical variables of Kabaddi and Kho-Kho Players of Haryana.”

1.6 OBJECTIVES OF THE STUDY

1. To compare the linear measurements such as height, weight, sitting height, Total leg length, thigh length, trunk length, total arm length, upper arm length, fore arm length, hand length, foot length and foot width of Kabaddi and Kho-Kho players.

2. To compare the body circum-frances of the shoulder chest, abdomen, hip, thigh and calf of Kabaddi and Kho-Kho players

3. To compare the bone diameters such as biacromial, bitrochanteric, femur bicondylar and ankle of Kabaddi and Kho-Kho players of Haryana.

4. To compare the skin folds measurements such as biceps, triceps, sub scapular, suprailiac, thigh and calf of Kabaddi and Kho-Kho players of Haryana.
5. To compare the body composition variables i.e. body density, fat weight, lean body mass (LBM) and fat % of Kabaddi and Kho-Kho players.

6. To compare the physiological variables i.e. basal pulse rate, vital capacity, Haemoglobin and blood pressure of Kabaddi and Kho-Kho players of Haryana.

1.7 HYPOTHESES

Keeping in view the objectives of the present study the following hypothesis have been constituted:

1. There would be significant differences in linear measurements between Kabaddi and Kho-Kho players of Haryana.

2. There would be significant differences in Body circumferences between Kabaddi and Kho-Kho players of Haryana.

3. There would be significant differences in bone diameters i.e. biacromial, bitrochanteric, femur bicondylor and ankle between Kabaddi and Kho-Kho players of Haryana.

4. There would be significant differences in skin fold measurements like biceps, triceps, sub-scapular, suprailiac, thigh and calf between Kabaddi and Kho-Kho Players of Haryana.

5. There would be significant difference in body composition i.e. body density, fat % fat weight and lean body mass between Kabaddi and Kho-Kho players of Haryana.

6. There would be significant differences in Physiological variables i.e. Blood Pressure. Haemoglobin, vital capacity, and basal pulse rates of Kabaddi and Kho-Kho players of Haryana.
1.8 DELIMITATION OF THE STUDY

1. The present study was delimited to selected Kabaddi and Kho-Kho players of Haryana, who will be participating in Senior State Championship and Haryana Olympic Games of Kabaddi and Kho-Kho.

2. Only 120 male players of Kabaddi and 120 male players of Kho-Kho were taken as the subject.

3. Subject age ranging between 18-27 years.

4. Subtracts were measured tested for different anthropometric variables by using venire calliper, anthropometric rod, skin fold calliper and measuring tape.

5. The substracts were also measured for vital capacity by digital peak flow meter, pulse rate and blood pressures measured by digital apparatus. Haemoglobin test were done by the lab technician in pathological lab.

6. For assessing Body composition, Durmin and Rehman’s equation was used to find out the body density and fat percentage was calculated by using Siri Equation (1956)

1.9 LIMITATIONS

1. Daily restive of the Kabaddi and Kho-Kho players might have and an effect on the study is taken as the limitation for the study.

2. Food habits of the Kabaddi and Kho-Kho players might have and an effect on the study is taken as the limitations for the study.

3. Social background of Kabaddi and Kho-Kho players is also taken as the limitations for the study.
1.10 DEFINITIONS OF THE TERM USED

The various terms used in the study are defined as follow:

Kabaddi

Kabaddi game is played in a marked rectangular area which is divided into two equal courts. A player of one team enters with the cant into court of the opponent team consisting of seven players and tries to affects them.

Kho-Kho

Kho-kho is also played in a rectangular marked area with two poles fixed at the two longitudinal sides of the rectangle. The marking on the rectangle and sitting arrangement of 8 players on the central line is done with the fixed standards. In Kho-Kho, one player chases the three defensive player of the opponent team around, the rectangle, the poles and around the sitting players.

Age

Asimov and other (1966) defined age as the period, usually expressed in number of user that has elapsed since the birth of a living person.

Weight

Onions (1948) expressed that the body weight is the measurement of physical or material frame of the whole material organism (men/women) as determined by means of weighing.

Anthropometry

Anthropometry is a branch of ergonomics that deals specifically with the measurement of people, particularly with measurements of body size, shape, strength and working capacity (Pheasant, S.T., 1998).

Linear Measurements

It is the vertical distance from the horizontal ground. The stature was measured with an anthropometric rod. The measurement was taken with the subject standing straight against an upright wall touching it with needs, buttock
and back. The head was oriented in the Frankfort plane (the upper border e.g. the tragus of the ear or the tragion and the lower border of the eye socked where on a horizontal line) and the needs were together, and the hands were hanging downward. The subject was stretched upward by a gentle traction on the mastoid region, taking care that the heel were kept on the ground. The anthropometer was held vertically in front of the subject in mid-segital plane and the horizontal movable bear was brought down touch the point the stature was recorded to the nearest of a millimeter

**Body Composition**

The four skin fold measurement were used to estimate the density, percent fat, lean body mass and fate weight as the main constituents of body composition.

**Body Density**

This indicates the weight in grams per cubic centimeter of body tissues. Body density is estimated from the sum of four skinfolds measurements (Biceps, Triceps, Subscupular and Suprailiac). In the present study body density was estimated using Durning and Reliman’s equation (1967).

**Fat Percentage**

Percent fat is the amount of fat in 100 kg. of body weight.

**Fat Weight**

This is the weight of the overall body fat, which is deposited in the subcutaneous area of the body. About fifty percent of the depot fat is stored in specialized cells under the skin, the thickness of which depends upon the amount of fat in the body.

**Lean body mass**

This is the amount of muscle in the body. Lean body mass is considered to be divisible into biological constant proportions. These would include water (70-72%), minerals (7%) and organic substances including an undermined but probably constant percentage (2-3%) of essential liquids in bone-marrow, the
central nervous system and other organs. In other words, the lean body mass includes the weight of the essential fat (Bakhnke and Wilmore, 1974).

**Physiology**

The scientific study of an organism’s vital functions, including growth and development, the absorption and processing of nutrients, the synthesis and distribution of proteins and other organic molecules, and the functioning of different tissues, organs, and other anatomic structures. Physiology studies the normal mechanical, physical, and biochemical processes of animals and plants.

**Physiological Parameters**

Physiological variables may be defined as those variables which are directly linked with various physiological systems and which may be voluntary or involuntary such as pulse rate, vital capacity, Haemoglobin and blood pressure etc (Toor, 1996).

**Pulse rate**

Pulse rate is actually the frequency of pressure waves (waves per minute) propagate along the peripheral arteries such as the carotid or radial arteries (Astrand and Rodahl, 1970).

**Haemoglobin**

A mature blood cell that contains haemoglobin to carry oxygen to the bodily tissues; a biconcave disc that has no nucleus.

**Vital Capacity**

Vital capacity is the maximum amount of air that a person can expel from the lungs after first filling the lungs to their maximum extent; it is equivalent to the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume.

**Peak Expiratory Flow Rate**

Rate of flow of air per minute of the peak expiratory condition is known as peak flow rate (Wooton and Freeman, 1982).
FEV1

It represents the volume of air exhaled in the first second.

Blood pressure

The blood pressure is the pressure of the blood within the arteries. It is produced by the contraction of the heart muscle. It's measurement is recorded by two numbers. The first (systolic pressure) is measured after the heart contracts and is highest. The second (diastolic pressure) is measured before the heart contracts and lowest. A blood pressure cuff is used to measure the pressure.

Systolic Blood Pressure

Systolic blood pressure explained that when the left ventricle contracts and pushes the blood into the aorta and which as a result of push produces pressure and that pressure is know and the systolic blood pressure. Ross and Wilson (1981)

Diastolic blood pressure

Diastolic blood pressure explained that when complete cardiac diastolic occur and heart is resting following the ejection of blood the pressure is regulate within blood pressure. Ross and Wilson (1981)

1.11 SIGNIFICANCE OF THE STUDY

1. The finding of the study has the significance of self assessment of physiological and Anthropometrical variables of Kabaddi and Kho-Kho players.

2. The study seeks to bring out the significance differences through comparison of selected physiological and Anthropometrical variables between Kabaddi and Kho-Kho players.
3. The study has the significance of making a training schedule for the players, coaches, trainers and physical education teachers of Kabaddi and Kho-Kho players for developing different structure pertaining of this game.

4. The study, contrary to above, has the significant to select the players for Kabaddi and Kho-Kho games on the basis of the evaluation of physiological and Anthropometrical measurement as possessed by one individual.

5. The present study has also the significance of proposing guideline and index for future researchers in the field of Kabaddi and Kho-Kho game related to physiology and Anthropometrics measurements.