Chapter I

INTRODUCTION

Changes and challenges are the twin laws of nature and they affect every aspect of human life. Changes are taking place all around, and because of these changes, new challenges present themselves. Man is constantly trying to meet these challenges and excel his previous performance every time.\(^1\)

It is because of the growing change in the competitive philosophy of sports that a close liaison has developed among sports scientists, team physicians, athletic trainers, coaches and athletes to investigate modern scientific techniques in terms of selection of athletes best suited to the activity and to devise new tactics and training methods. The author has also attempted to identify the fitness factors that help in achieving a level of skill and fitness, which a

player can attain through proper training and evaluation in the game of football.

How did soccer become the world’s most popular sport? It is a long story that begins more than two thousand years ago. Soccer was played by the ancient Greeks and the Romans. It was also played in one form or another by the Chinese, the Japanese and the Aztec Indians. Early soccer was not always played with a ball. Sometimes a bag stuffed with straw or an air filled animal’s bladder was used.

Modern soccer has set rules and laws, they are the same in every country. The Federation International de Football Association governs soccer.\(^2\)

Soccer is often called the “Universal Game”, what hockey is to India, soccer is to the rest of the world. It is difficult to determine

how many millions of people play the game, but it is estimated that the number of fans may reach over 800 millions. In many parts of the world, crowds of 100,000 or more at a single match are not uncommon. In Brazil, a stadium built solely for soccer games seats 200,000 spectators. The game is played in more than 180 nations and enjoys a long history.\(^3\)

Of all events in human history, the one to attract the largest audience was not a great political occasion, nor a special celebration of some complex achievement in the Arts & Sciences, but a simple ball game, a soccer match. On a day in June, 1978, it is claimed that more than a thousand million people turned up for the World Cup Final between Argentina and Holland. This means something like one-quarter of the entire world population stopped whatever they were doing and focused their attention on a small patch of grass in South

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America where 22 bright clad figures were kicking a ball with a frenzy of effort and concentration.⁴

It is a game that sends people all over the world into frenzy, creates National and International heroes too like Pele the great, Socrates, Zico, Bebeto, Romario of Brazil, Johann Cryuff, Rudd Gullit, Van Basten, Richard of Holland, Diego Maradona, Goychochia, Baptistuta of Argentina, Lothar Mathaeus, Rudi Voller, Klinnsman of West Germany, Valdano, Asprilla of Coloumbia, Frank Baressi, Baggio of Italy, Zidane of France, Louis Figo of Portugal and so many others. As a result there is a constantly increasing demand for more knowledge and better training means to coach the game. Sports scientists, coaches and physical education teachers are charged with the responsibility of training and teaching their player’s soccer

techniques and tactics, to develop teams who perform at the maximum level of effectiveness.\

Five decades of Independent India has not achieved much as to the participation of women with the rising of odds stacked against them. Indian sports has something to build upon, but for that more needs to be done. The Human Resources Development Minister will stand at the pulpit and repeat the slogan of making sports compulsory in schools. Very little chance of that happening when 95% of the schools don’t even have their own playgrounds. What is needed is a ‘sports for all’ campaign.

Only if there is an increase in participation per household in sports will women’s sports get the right impetus, because the more mothers play sports, the more their children will follow. It will take time, but we have an entire millennium ahead of us. For too long players have suffered due to late clearances, running around for kits

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and sponsors and shopping for gifts for favorable officials back home, has snapped the physical, mental and financial energies of our players. At present, the crisis between political interference in participation.  

In 1948, the year when some unknown Indian soccer players moved westward beyond the Suez to London to take part in the Olympic Games a thrill, a dream, an aspiration of all sportsmen came true for Indian soccer players. In 1951, in Delhi further glory was attached to Indian soccer, when they rose to the peak of their height and won the Asian Gold.

Gone are those days when Indian soccer had its height and health, name and fame to talk about. The constant deterioration in Indian soccer is still a mystery. The miserable failures of Indian soccer is in grooming of youngsters and the negligence in cultivating required level of physical fitness, modern means and methods of

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6 "Indian Women in Sports", Femina, (March 1, 1999): 10
training and knowledge of its changing nature to uplift the total performance.\textsuperscript{7}

The game of soccer requires a considerable amount of physical fitness and mastery of skills. Now the question that arises in the mind of every individual is “What does the term ‘physical fitness’ deal with?”. Fitness is very specific to the sports or activity, which a person does. For example, the fitness required to be a 100 mts. sprinter is entirely different from that needed to be a marathon runner. Similarly, the fitness required to play soccer is different from that needed by rugby, hockey or squash. Soccer players must have good endurance, good lower and upper body strength, good flexibility, agility and speed.\textsuperscript{8}


Soccer is a game of constant action and requires continuous adaptation to changing situations by the team as a whole, as well as by individual players. Although it is a team game, there is ample room for players to display their brilliance through individual performance with the ball as well as through team play involving improvisations and tactical knowledge. As in most other sports, the skills of soccer can be practiced in an area of any size and on almost any type of surface.\textsuperscript{9}

Environmental factors and field conditions affect the game of soccer to a large degree and the team that best adapts to them will increase its chance of winning. Snow, ice, rain and wind can bring parity to teams of different abilities. Teams can use adverse conditions to their advantage if they know how to deal with them and how their opponents perform in a particular situation.

\textsuperscript{9}Ibid.
The quality of the ground has an effect on the game of soccer. A smooth ground is particularly suitable for a cultured, low passing game. But if it is uneven, it is unwise to keep the ball low since direction is unsure but the players are also hampered in performing the technical movements correctly. Hard, loose or grassy grounds have different effects on the ball. It bounces high on a hard surface. A moderately loose ground helps the players in working the ball by observing its pace. A completely loose, in most cases sandy ground always creates difficulties. The ball deceives the players and the players tire quickly, since they use up their strength in running over the loose ground.

On very grassy grounds, the angle at which the ball rebounds from the ground is not always identical with what would otherwise be expected. As exclusively outdoor game, soccer is influenced to an immense extent by the weather.
Rain can make a fundamental transformation in ground conditions within a relatively short time. The conditions of the field varies according to the quantity of rain. A wet and slippery ground may also cause the ball to bounce in the same deceptive manner as on a very grassy field. If the ball is sent in front of a running colleague in the same manner as when passing on a hard ground, it is likely to go too far ahead because of the treacherous conditions. On a wet pitch, the ball must be sent directly to the foot of the teammate. A muddy or snow covered field of play is usually more favorable for strong players.

Special care is required if the ball is in goal area and the ground is heavy. The ball is liable to stick in a pool, and both the attackers and defenders should reckon with this possibility. Since the ball becomes greasy on a muddy or slippery ground, the goalkeeper is bound to have difficulties in clutching and holding.  

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In India, due to geographical and climatic conditions, development and maintenance of good ground is not always possible. Scarcity of water and funds also act as limitations in developing and maintaining good grounds. That is why in India condition of the ground varies according to the region, climate conditions of the region, popularity of the game and other factors.\textsuperscript{11}

With the constant demand for high sports performance, the concept of soccer today has been changed. The concept of "total soccer" applies skill development, technical development, development of all-important motor components and physiological parameters which are closely associated and contribute to performance in soccer. Not only in the technical, physiological and physical development, the Sports Scientists are also making efforts to develop the intellectual ability of soccer players.\textsuperscript{12}

The existing literature in the field of soccer shows that endurance, speed, agility, maximum leg strength, upper body strength, leg power, muscular endurance, flexibility, coordination and reaction time are important pre-requisites for efficient soccer performance, whereas excess body fat proves to be a hindrance.\textsuperscript{13}

A football player needs "speed" to reach the ball quickly and to penetrate through the defence, on the other hand the defender needs speed of recovery to guard his goal and even the goal-keeper needs speed of movement to control the ball as quickly as possible, specially in a one to one situation, speed is the most important factor to decide who will beat whom in the struggle for possession of the ball.

Strength deserves considerable attention for soccer players. Players need to produce power when kicking a ball, throwing the ball

for a long distance or taking a powerful shoot at the goal. While accelerating quickly or jumping, soccer players can and must work for improving their strength and power to play more effectively.\textsuperscript{14}

In soccer, it is vital that the players should have endurance. It is useless to dominate a match in the beginning because the players with superior skill may lose it as in the long run they become exhausted and can no longer perform well. A lack of endurance results in fatigue which diminishes several elements of good performances such as timing, coordination, reaction time, general alertness and concentration. Since increased endurance delays the onset of fatigue, it is therefore improves the overall performance during the match.\textsuperscript{15}

Agility plays a vital role in soccer because when a soccer player participates in the game of soccer, he has to change directions and movement of various parts of the body while dribbling the ball,

\textsuperscript{14} Beim, Principles of Modern Soccer, PP. 220-221.
\textsuperscript{15} Ibid, PP. 194-195
tackling the opponent and in the case of the goalkeeper to save the goal.\textsuperscript{16}

Physiological changes in the human body may be brought about by different types of conditioning programmes such as jogging, calisthenics, sand training, circuit training etc. These activities bring about changes in certain physiological parameters if they are carried out for certain duration to time.

Changes in respiratory responses to exercise take place during training. As a result, for a standard amount of exercise the pulmonary ventilation is reduced and the amount of breathing decreases in the trained subject even at rest the depth of breathing is greater and the respiratory rate may fall from about twenty to eight breaths per minute.\textsuperscript{17}

A very noticeable change effected with training is the reduction in resting heart rate. This body-cardiac may result in resting values for the athlete as much as 20-30 beats per minute slower than for an untrained person. Moreover, and perhaps more importantly, the endurance-trained athlete enjoys a lower heart rate for any given workload when compared with his untrained counterpart.\textsuperscript{18}

In respect of physical fitness, the Indian players are lagging far behind in comparison to western players. It is not denying the fact that they are naturally gifted with the climatic condition and normal physique. But the Asian countries like Japan and Korea have proved that through continuous and scientific training, those barriers can be tackled and considerable physical fitness necessary for playing soccer may be achieved.

In India, football is mostly played in Goa, West Bengal, Kerala, Mumbai. In Goa, competitive soccer is mostly played during the rainy season although; the players continue training in winter and summer. Goa is one of the top soccer playing states with beautiful beaches. Playing on different resistant surfaces eg. Dry sand and wet sand, either during training or during competition increase the physical and physiological ability which in turn may contribute to some extent to total soccer performance.

Although women’s soccer is at foetus stage and not often heard of in India due to lack of proper management and training. The myth attached to women that they are the weaker sex and not capable of vigorous physical activity. Women’s soccer in Goa is at the infancy stage due to lack of motivation. No doubt school and inter-collegiate tournaments are organized every year but the quality of performance has been poor. Coaches are still in search of different methods of training for development of physical and physiological performance level in soccer.
Due to lack of high modern technology and sophisticated instruments in India high level of training programmes are still far behind that of the developed western countries.

Thus, a query had interested the scholar regarding the effect of different compact surfaces and their varied resistance to speed, strength, endurance, agility and the physiological changes which result from training like heart rate, blood pressure, respiratory rate and vital capacity and therefore such study was undertaken.

**Statement of the Problem**

The purpose of the study was to compare the effects of training on dry sand and wet sand in relation to physical and physiological variables of Goan (girls) soccer players, and also to find out which surface brings maximum changes in selected physical and physiological variables.
Delimitations

1. The study was delimited to girls soccer players taking part in the school competition in Goa, between the age group of 14 to 16 years of age.

2. The study was restricted to 10 weeks of training on dry sand and wet sand.

3. The study was further delimited to the following physical and physiological variables:

Physical Variables

i) Speed

ii) Strength (Explosive Strength)

iii) Agility

iv) Endurance

Physiological Variables

i) Heart Rate

ii) Blood Pressure

iii) Respiratory Rate

iv) Vital Capacity
Limitations

The subjects selected for the study were within the State of Goa. But they were not within a residential camp. The factors like diet, life style, daily routine, habits etc., which might affect the result of the study, should may be considered as a limitation of research.

Hypothesis

It is hypothesized that there will be no significant difference between training on wet sand and dry sand on physical and physiological variables, but there will be definite changes in physical and physiological variables due to 10 weeks of training on sand surfaces.

Definition and Explanations of Terms

Training

Sports training is a process of preparation of a sportsman, based on scientific and pedagogical principles, for higher performances.\textsuperscript{19}

Surface

Surface means the outside of a material body on the upper boundary of the soil i.e. outward aspects of the training field.

Dry Sand

Dry sand surface means the surface full of sand, in the river bed away from the portions of water flow and its adjacent wet area.

Wet Sand

Wet sand surface means the surface full of sand soaked with water near the seashore just beside the water flow.

Speed

Speed is the quickness with which one is able to move his/her body from one point to another.\(^{20}\)

\(^{20}\) Robert V. Hockey, Physical Fitness & the Pathway of Living (St. Louis: The CV Mosay Co., 1973), PP. 93-94.
Strength

Explosive strength will be studied for the purpose of the study.

Explosive Strength

It is the capacity of the individual to release maximum force in the shortest period of time.\textsuperscript{21}

Endurance (Cardio-Vascular Endurance)

Cardio-vascular endurance is the moderate contractions of large muscle group for relatively longer periods of time, during which maximum adjustment of the cardio-respiratory system are necessary.\textsuperscript{22}

Agility

Agility is the speed of changing position or in changing direction.\textsuperscript{23}

\textsuperscript{22} H. Harrison Clarke, Application of Measurement to Health and Physical Education (Philadelphia W.B. Saunders Co., 1984), P. 152.
\textsuperscript{23} Ibid, p.227
Pulse Rate

Pulse rate is a wave of distention and elongation that is felt in an artery wall due to the contraction of the left ventricle forcing blood into the already full aorta. When the aorta is distended a wave passes along the walls of the arteries and can be felt at any point where an artery can be pressed gently against the bone.\(^{24}\)

Pulse rate can be defined as the number of pulse waves per minute felt at the radial artery.

Blood Pressure

Blood pressure is the pressure exerted on the walls of the arteries as the heart pumps the blood through the body.\(^{25}\)

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Systolic Blood Pressure

When the left ventricle contracts and pushes the blood into the aorta the highest pressure produced is known as the systolic blood pressure.

Diastolic Blood Pressure

When complete cardiac diastasis occurs and the heart is resting following the ejection of blood, the least pressure within the arteries is termed as the diastolic blood pressure.\textsuperscript{26}

Vital Capacity

The total volume of air that can be voluntarily move in one breath, forceful inspiration to maximum expiration or vice-versa.\textsuperscript{27}

Respiratory Rate

The distention of the arterial walls at the beginning of systolic ejection of blood is not confined to aorta but travels down the arteries

\textsuperscript{26} Ross and Wilson, Foundation of Anatomy and Physiology, P. 64.
as a wave followed by wave of recoil. In the arteries that lie close to
the body such as radial artery of the wrist, the arrival of the wave of
distention and subsequent recoil may be felt as a distant throb pulse
which offers convenient method of counting heart rate.\textsuperscript{28}

\textbf{Respiratory Rate}

The number of inspiration or expiration in one minute is known
as respiratory rate.

\textbf{Soccer}

Soccer is a football game, played by the teams of eleven players
in each side and using a round football. The designation ‘soccer’ is
derived from Association Football and is distinguished from
American Football, Canadian Football, Rugby and several other sports
in the Federation De International Football Association. It is
popularly known in India as ‘Football’.\textsuperscript{29}

\textsuperscript{28} Laurance E. Morehouse and Augustus T. Millaer, \textit{Physiology of
Soccer Players

Those who play the game of soccer are called soccer players.

Significance of The Study

The present study will be significant in the following ways:

1. The study will critically examine the physical and physiological profiles which are essential for developing women soccer playing ability.

2. The results of the study will also be helpful for preparing the training schedules of female soccer players.

3. The results of this study may further help coaches and trainees to train players in soccer as per the requirement of the ground conditions.

4. The study will provide the knowledge about the surface which will be more helpful for enhancing performance.