CHAPTER – V
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction:

Football, which is also known as Soccer, is probably world’s most popular sport, played in practically every nation at varying levels of competence. Football may be played competitively or for fun, as a career, a means of keeping fit or simply a recreational pursuit (Reilly, 1996). Soccer is the most popular sport in the world because it is performed by men and women, children and adults with different levels of expertise. The popularity of the game is reflected in the millions who participate in Soccer in lower levels of play. Soccer is now being played in more than 210 countries throughout the world. Soccer is popular because of the fact it is a simple game requiring very minimum infrastructure and equipment.

Success in soccer is dependent upon a variety of factors including the physical characteristics and physiological capacities of the players, their level of skill, their degree of motivation, and tactics employed by them against the opposition. Some of these factors are not easily measured
objectively, but others can be tested using standardized methods and can provide useful information for coaches (Mosher, 1985).

In soccer, speed plays an important role; the accelerated pace of the game calls for rapid execution of typical movements by every member in a team. In many instances, successful implementation of certain technical or tactical maneuvers by different team members is directly related with the degree of velocity deployed (Kollath & Quade, 1991).

In soccer, in addition to mental, psychological, physiological and coordination features, the improvement of conditional features is important as well. Peak conditional features in soccer players provide an advantage. Much of what affects the results of a match occurs during or after the high intensity sprint. Analysis of the specific movements and activities performed by football players during games can provide much relevant information on which suitable training programs can be designed (Dawson, 2003). According to the Dawson (2003), the large majority of sprints performed in
soccer take six seconds or less to complete, over distances of only 10-30 meters, and many of the sprints involve at least one change of direction. As running speed increases, longer strides are taken. In this instance, the swing phase involves greater knee flexion and hip extension, and greater hip flexion in the latter part of the phase (Howe, 1996).

During soccer games, many actions affect the result of games. These actions are characterized by intermittent and multi-directional movements, as well as the movements of changing intensity and time. Reilly and Ball (1984) stated that each game typically involves about 1000 changes of activity by each individual in the course of play, and each change requires abrupt acceleration or deceleration of the body or an alteration in the direction of motion.

Soccer is played by even players, which they play in different positions such as defense, midfielder, forward and goalkeeper positions and they all have different responsibilities. Anthropometric and VO$_2$ max measurements may differ between footballers of various playing positions, for instance
striker, goalkeeper, defender and midfielder. Consequently, differences in the physical characteristics of footballers in different playing positions within teams are worth investigating.

In the recent years, there has been remarkable development of research in the area of soccer physiology and medicine. The ideal physiological and anthropometric profile of a successful soccer player was investigated, and it has been demonstrated that the game of soccer has become more dynamic, which can be attributed to improvements in the speed and agility of players. Physical fitness was also compared between players in different playing positions. Goalkeepers demonstrated different fitness characteristics from outfield players. They were taller and heavier, more flexible in hip extension and knee flexion, and had higher leg extension power and a lower peak O2 uptake. However, only minor differences were observed between defenders, midfield players, and attackers.]

Capela, C et al (2004) having compared the anthropometric and motor performance parameters such as
aerobic fitness, speed, agility and strength of different age group Portugal Club Soccer players, have reported that no significant difference in anthropometric parameters were observed, whereas significant differences in all motor performance parameters were observed and they also attributed this difference to experience and training.

J.D. Vescori et al (2006) studied the positional characteristics of division I college female soccer players conducted tests on height, body mass, acceleration, speed, agility, lower body power, counter movement jump and aerobic capacity and reported that defenders and goal keepers tended to be heavier compared to forwards and mid-fielders. Positional differences did not appear in any of the physical fitness parameters. However, they have further reported that defenders showed slightly slower times for the speed and agility tests, while goal keepers tended to be slower on the agility tests compared to the forwards and mid-fielders. Aerobic capacity was similar across the four positions.
Leonardo et al (2007), having studied the fitness profile of under-15 Brazilian Soccer players by field position have reported that there were no significant difference in the field position in Anthropometric measures such as body mass, sum of skin folds, 30 meters sprint, Squat jump and counter movement jump.

Jonathan Bloomfield et al (2007) studied the physical demands of different positions in (FA) English Premier League Professional Soccer Players from three positional groups (Defenders, Mid-fielders and Strikers) representing various professional clubs in 2003-2004 season and reported that significant differences existed between Strikers, Mid-field and Defending players in various kinds of body movements with the soccer ball and without soccer ball and have suggested different type of specific conditioning program for different positions.

When making comparisons between players in different positions, goalkeepers were found to be significantly taller and heavier than outfield players, with greater range of movement in hip extension and knee flexion, but their peak oxygen uptake
was lower than outfield players. Goalkeepers also displayed greater leg extensor power than midfielders and defenders. Midfielders were older than strikers, defenders taller than midfielders and strikers more powerful than midfielders. Professional players do vary in weight and size especially when ethnic influences are taken into account. For example, data on International Asian teams demonstrated that their players were smaller in physical size, especially when compared to European teams. Midfielders are often the smallest whilst central defenders are often the tallest and heaviest outfield players on the pitch. A scientific study showed that a professional team had an average body weight of 77.7 kg compared to 73.4 kg for semi-professionals. Body shape or somoto type studies indicate that professional players tend to belong to the mesomorphy category meaning a more muscular make-up. Indeed, studies on top English League Players when compared to all Olympic athletes showed they mostly resembled Olympic 400 meter hurdlers and triple jumpers but were on average heavier and smaller. Body composition is important as any superfluous fat
affects the ability of the body to run and jump due to the extra weight. Professional footballers usually show values of between 9%-16% (generally an adult male in his mid-twenties averages about 16%). However, this can rise after season when the season has finished. For example, a study of a top English professional team showed a mean % of body fat as high as 19.3% when returning to pre-season training indicating that professional players need to take care with their diet as well as undertaking some form of aerobic exercise to keep fit during the off-season. During the game, players are required to perform activities like jogging, running (forward and backward), kicking, turning, heading and throwing. Fitness is very important for everyone on the field.

At competitive, organized levels, football is an endurance sports that incorporates periods of intense exercise interspersed with lower levels of activity over a 90-minute period (Reilly, 1996). Therefore, a large amount of aerobic power is essential to a footballer. According to profiles exhibited by professional players, the fitness requirements for soccer are - flexibility,
speed, speed endurance and aerobic endurance. Strength in the lower limb is of obvious concern in soccer: the quadriceps, and hamstrings must generate high forces for jumping, kicking, turning and changing pace. The ability to sustain forceful contractions is also important in maintaining balance and control. Isometric strength is possibly important in maintaining a player’s balance on a slippery pitch and also in contributing to ball control. For a goalkeeper almost all the body’s muscle groups are important for executing his skills. For outfield players, the lower part of the trunk, the hip flexors and the plantar flexors and dorsi flexors are used most. Upper body strength employed in throw-ins and the strength of neck flexors could be important in forcefully heading the ball. At least a moderate level of upper body strength should prove helpful in preventing being knocked off the ball. The players playing in different positions were found to differ in fitness profiles.

Goalkeepers appeared to have a different fitness profile from the other player positions, whereas the three groups of outfield players were similar in their performance on the tests.
Strength tests have also shown top level goalkeepers to be significantly stronger compared to other playing positions. Centre backs have been found to be both heavier and faster and show greater anaerobic power than wingbacks. Aerobic power assessed through VO2 Max values varies according to playing position. For outfield players, midfielders have significantly greater aerobic power values whilst central defenders have the lowest values.

Playing position and ethnic differences must always be taken into account when measuring performance. Comparison between different playing positions showed that the goalkeepers had different characteristics from the outfield players, a reflection of the difference in requirements between these player groups. In accordance with Davis et al. (10), they have a lower peak O2 uptake indicating that running ability is less important. They were taller and heavier (10) than outfield players, and displayed a greater leg extension power because the important tasks of a goalkeeper are to react and move quickly, to jump or dive to save or deflect shots, and to cover a
large perimeter, and a difference in jumping ability with outfield players, defenders, midfielders, and strikers was also revealed. Defenders were significantly taller than midfield players, which can be taken as an indication that size is an advantage in this position—to be able to reach high balls in their defensive role and perhaps to increase their reach in tackling duels, as well. No difference in peak O2 uptake between midfield players and strikers or defenders is reported as has been suggested various experts. The small differences observed in physical fitness between players in different player positions is perhaps not surprising, because in modern soccer each outfield player assumes a larger role in the overall play of the team, so the positional differences seen in recent studies are less than previously ones. Countries who have advanced and produced good results in international level soccer could achieve such results due to scientific research and identification of talents on scientific lines.

Specific physical and physiological characteristics of soccer players plying in different positions have been studied
and the results are used by coaches not only to select the talents but also to modify training programs and to help players prepare for the game strategy. The modern soccer relies on the ability of all players to attack and defend whenever necessary. Therefore, it is important that all players achieve a high level of performance in the basic skills of kicking, passing, trapping, dribbling, tackling and heading. Analysis of the physical and physiological characteristics of the players and determination of the specific requirements for optimal performance are thus a necessity (Tiryaki et al., 1996).

Though India could not make a big mark at World level Soccer excepting winning Asian Games once and participation in Olympics, the game is found to be so popular throughout the country and is being played at different age levels, Schools, Colleges, Universities, Industrial Clubs, Defense Units, Public Sector Clubs, Professional Clubs etc. The Soccer in India is promoted by All India Football Federation, Association of Indian Universities, School Games Federation of India etc. The competitions for sub-juniors, juniors and seniors in male and
female -sections are being organized by the All India Football Federation. The competitions for school level players of both boys and girls in various age groups are being organized by the School Games Federation of India and competitions for college and university male and female players are being conducted by Association of Indian Universities. Besides these competitions, the competitions are also being conducted by Public Sector undertakings and tournaments are also conducted by clubs. Indian Football teams are participating regularly in Asian competitions and in other international tournaments. Coaches are trained in scientific lines by National Institute of Sports, Patiala and Indian coaches are also attending seminars and International courses regularly. Even Foreign coaches are hired for training Indian National Football teams and also to train Indian coaches. Despite all these efforts, the standard of Indian Football is not high enough to be compared with other Asian counterparts even, leaving aside elite Nations from European and South American continents. The reasons for such a condition are many. No scientific method is being followed to
select the talents at various levels of competitions. No systematic scientific training is being carried out for young and talented players with long term planning. Sufficient number of trained coaches are not available with all clubs and as such the teams are not being trained with scientific planning. The Competition Season for Football is not clearly defined and fixed by the Agencies, which are promoting this sport game in India and this causes problems for the teams to be trained on scientific lines with proper training plans of different seasons.

Research findings indicate that performance in Soccer is dependent on anthropometric parameters such as height, weight, leg length, body mass, physical fitness parameters such as strength, speed, explosive strength of lower extremities, speed endurance, endurance, flexibility and agility and psychological parameters such as self confidence, anxiety etc. Research findings also indicate that players at different levels and in different playing positions also differed in these parameters. Advanced countries identify the talents giving due considerations to the performance determining factors and then
develop the identified talents on scientific lines. No such efforts are being made in our country and hence low standard of soccer and hence we are not able to compete with our Asian counterparts even, leaving aside top South-American, European countries etc.

University level Soccer players will be graduated into Professional level club players and hence right type of talents are to be selected and trained at University level itself for raising the standard of Indian Soccer. In order to raise the standard of Inter-University level Soccer it is felt necessary to conduct a research study to identify the performance determining parameters of Soccer players playing in different positions so that right type of talents can be selected and scientific training can be given to develop the fitness and essential soccer skills with them. Hence the research was conducted on the topic,
Anthropometric, Physical Fitness, Psychological Parameters and Football skills according to Playing Positions of Intervarsity male Soccer Players

5.2. **Objectives of this Research Study:**

(i) To find out whether the University level Soccer players playing in different positions differed in the selected anthropometric parameters.

(ii) To find out whether the University level Soccer players playing in different positions differed in the selected Physical Fitness parameters.

(iii) To find out whether the University level Soccer players playing in different positions differed in the selected Soccer Skills.

(iv) To find out whether the University level Soccer players playing in different positions differed in the selected psychological variables.

5.3. **Significance of this Study:**

Talent identification in soccer is a process of recognizing current participants, who have the potential to become elite players. It entails predicting performance by measuring
physical, physiological, psychological, and sociological attributes as well as technical abilities. Earlier talented players are recognized the more time they have to prepare in quality facilities, which will increase their chances of becoming a successful soccer player in the future. College level and University level players are the future talents, who can be groomed into top level players, for which proper technique to be adopted to identify the right talent at that level. We should also know that physical, physiological and psychological factors and soccer skills, which determine top class performance in soccer in general and also as per playing position. The findings of this study will enable us to get enough information on talent identification at university level so that they can be put to rigorous training for grooming into top class players.

5.4. **Delimitation of the Study:**

The study will be delimited to male soccer players of North Zone University Football Players, who will participate in North Zone Inter-Varsity Championship only.
5.5. Limitations of the study:

The data on all the volunteered subjects can not be collected at the same time, as the Universities were having competition matches on different dates and reporting at the venue on different dates and at different times and the could be collected only during their rest days.

5.6. Hypotheses:

The following hypotheses are formulated to verify through this study:

(i) There will be no significant difference in the selected anthropometric variables of the University level male soccer players playing in different playing positions.

(ii) There will be no significant difference in the selected Physical fitness variables of the University level male soccer players playing in different playing positions.

(iii) There will be no significant difference in the selected Football (Soccer) skills of the University level male soccer players playing in different playing positions.
(iv) There will be no significant difference in the selected Psychological variables of the University level male soccer players playing in different playing positions

5.7. **Research Design:**

This Analytical Study was conducted on selected Inter-University Soccer players from North Zone Universities, who participate in North Zone Inter-Varsity Football Championship which was held during October, 2008 at Patiala, Volunteered as subjects for this study.

5.7.1. **Subjects:**

The subjects volunteered for this study from different North zone Universities were 200 in number in all and their break-ups as per playing position and as per Universities are presented vide Table 1 and 2:
Table 1

Distribution of Subjects on the basis of Playing

<table>
<thead>
<tr>
<th>Position</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Keeper</td>
<td>24</td>
<td>12.00</td>
</tr>
<tr>
<td>Defender</td>
<td>67</td>
<td>33.50</td>
</tr>
<tr>
<td>Mid Fielder</td>
<td>67</td>
<td>33.50</td>
</tr>
<tr>
<td>Striker</td>
<td>42</td>
<td>21.00</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 2

Distribution of subjects on the basis of University

<table>
<thead>
<tr>
<th>Name of the University</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjabi University, PTA.</td>
<td>20</td>
<td>10.00</td>
</tr>
<tr>
<td>PAU Ldhiana.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>Delhi Uni.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>Luck. Uni.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>Breli Uni.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>PU Chandigarh.</td>
<td>19</td>
<td>9.50</td>
</tr>
<tr>
<td>GNDU Amritsar.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>KUK KURUKSHETRA.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>MDU ROHTAK.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>AMU ALIGARH.</td>
<td>18</td>
<td>9.00</td>
</tr>
<tr>
<td>KU NAINITAL.</td>
<td>17</td>
<td>8.50</td>
</tr>
</tbody>
</table>
5.7.2. Methods:

For this analytical research the variables and the tests selected to measure the variables were:

(i) **Anthropometric variables selected:**

a) Standing Height (Stature),

b) Body Weight (body mass),

c) Leg length,

d) Knee diameter,

e) Thigh girth,

f) Calf girth and,

g) Skinfolds (Biceps, Triceps, Subscapular, Suprailiac)

(ii) **Physical Fitness Parameters selected:**

a) Explosive Strength endurance of legs (measured through five hops with both feet test, which is considered as a valid test for Indian population as many Indian researchers have used this test in their studies) Nagerkoti (1989),

b) Sprinting Speed (measured through 40 meters sprint test) Malhotra et al (1979),
c) Agility (measured through 6 x 10 meters shuttle run test, Subramanian (1981),

d) Endurance (measured through 2.4 Kilo-meters run on 400 meters track) which is validated against VO2 max on treadmill and used by Malhotra et al (1979).

e) Flexibility (measured through bend and reach test), Subramanian (1979).

(iii) Psychological variables selected:

a) Self-Efficacy

b) Anxiety

c) Self-Confidence

(iv) Soccer Skill tests, which were used by Van Rossum and Wijbenga (1993) were selected:

a) Ball control with the body (skill 1),

b) Ball control with the head,

c) Dribbling with a pass (speed and accuracy),

d) Dribbling (speed),

e) Passing,

f) Shooting.
Tests selected:

Anthropometric measurements were conducted using Anthropometer rod, steel tape, Harpenden skin fold caliper, observing all precautions and instructions.

Physical fitness tests selected are: Five hops with right leg and Five hops with left leg, 40 Meters sprint, 6 X 10 Meters shuttle run, and Bend and Reach. All the tests were conducted as per instructions of the manuals.

The following football skill tests used by Van Rossum and Wijbenga (1993) were selected and administered as per instructions provided by the authors:

1. Ball control with the head (Ball juggling)

2. Passing

3. Ball control with the body (Ball juggling)

4. Dribbling with a pass (for speed and accuracy)

5. Dribbling speed

6. Shooting
**Psychological inventories used are:**

a) Self efficacy questionnaire, used by Ryckman et.al.(1982)

b) Anxiety scale (CSAI- used by Martens, 1982)

c) Self Efficacy questionnaire developed by Vealey et.al.(1998) and subsequently modified by WU & CHI (2000).

5.8. **Results:**

The data collected for each variable was analyzed for each playing position on the field, namely ‘Goalkeeper’, ‘Defender’, ‘Mid-fielder’ and ‘Striker’ and presented as descriptive statistics for each variable and also for all research subjects as per their playing positions.

The data was further analyzed to find out the mean differences among the subjects of varying field positions by computing ANOVA and the significance of difference was analyzed by computing ‘F’ score and is presented.
5.9. Conclusions:

Based on the results obtained in this research study, it can be safely concluded that:

1. Goalkeepers and Defenders were the tallest and heaviest among all the subjects selected for this study.
2. Subjects playing in different positions namely, Goalkeepers, Defenders, Mid-fielders and Strikers differ significantly in measurements of all anthropometric parameters except in calf girth.
3. Strikers were the fastest players among all.
4. Subjects playing in different positions differed significantly in explosive strength endurance of right leg and basic endurance.
5. Players playing in different positions did not differ significantly in physical fitness parameters such as speed, agility and flexibility.
6. Strikers were the best in ‘Shooting’ skill and the Goalkeepers were the worst in ‘Shooting’.
7. Mid-fielders were best in ball control.
8. Players playing in different playing positions did not differ in psychological abilities.