Chapter -II

REVIEW OF RELATED LITERATURE

A study of relevant literature is an essential step to get better insight about the procedure adopted and to understand the collected data.

The literature in any field forms the foundation upon which all future work will be built.

In this chapter the literature pertaining to the subject which gives meaning and added scope to this study were presented. Review of relevant literature involves locating, regarding and evaluating reports of casual observation and opinion that are related to the individual planned research project. It is aimed at obtaining a detailed knowledge of the topic being studied. Review of related literature not only gave the scholar an understanding of previous work that has been done, but also the results of the review actually provided the base for the analysis of the data used in this research.

The review of literature is confined to the libraries of Alagappa University, Karaikudi, Pondicherry University, Pondicherry and Annamalai University, Chidambaram.

Match analysis provides an opportunity to design the strategy of the game. It also determines the strong and weak points of our team or the opponents. This process of minutely viewing the game and then to learn through critical analysis makes the team and the players to confidently tackle the situation appropriately.

Chapman had investigated on the prediction of success in women’s field hockey. The subject were 106 players who participated in the international selection and training camps sponsored by the United States Field Hockey Association during the summer of 1978. The specific areas of investigation were anxiety, visual perception, manual dexterity, ball control and dynamic balance. Five tests were selected to assess the predictor variables.
1. Sports competition anxiety test
2. Herkowitz moving embedded figures test
3. Minnesota rate of manipulation test
4. Chapman ball control test and
5. Scott sideward leap test

Level of camp participation determined by player selection based on subjective evaluation of field hockey playing ability, served as the criterion measure in the study. A multiple discriminate function analysis was computed to identify those variables, which discriminated between the groups of selected camp participants.

A one way analysis of variance was employed to assess the difference between groups of players according to their playing position.

The scheffe’s post hoc test was applied when a significant ‘F’ ratio indicated that differences exited. The Pearson correlation technique was utilized to determine the relationship between some selected predictor valuables. Results indicated that dynamic balance, ball control and anxiety were the discriminating variables for the group of selected women hockey players. Visual perception and manual dexterity as measured in this study did not discriminate between successful and less successful field hockey players. Years if playing experience was not an important factor in group classification. Classification of subjects determined by the stepwise discriminate function analysis indicated that on the basis of the three discriminating variables, correct group membership could be predicted 78.95 percent of the time provided the goalies ball control sills were analyzed separately from these of the forwards and balls.

Bhangu had analysed the performance of Indian hockey team Atlanta Olympic 1996. In the performance of team as a whole, the data showed that the Indian team had the opportunity to take 42 field tries on the opponent goal in its 7 matches played out of which only nine goals were scored. Tactical analysis showed the Indians were unable to overcome the defensive tactics of teams like Argentina, Germany, Pakistan, South Korea and Great Britain. In the penalty
corner India could manage 2 goals out of 25 awarded. The two penalty corner
goals were scored through one direct and one indirect attempt. Indian could
manage to keep possession of the ball 257 number of times in their opponents 25
yards area and rivals could enter the defensive 25 yards area of the Indian team
239 number of times. Further the Indians entered into the opponents shooting
circle 92 times and managed only 42 shots on the opponent’s goal. For the penalty
stroke conversion India had 100 percent efficiency. He also observed the
turnover, interception and tackles done by each player of the Indian team.

Muthu Krumbathevar Bose had conducted “An Analytical Study of
Physical and Performance Variables of University and State men Hockey players,
playing at different playing surfaces”. For the purpose of the study thirty
university men hockey players were selected and thirty senior state men hockey
players, who played the senior national hockey championship, were also selected
as subjects. The following physical variables namely speed, agility, power and
endurance and the following performance variables namely dribbling, hitting,
trapping, and passing and total performance were chosen as variables. To conduct
the study three different surfaces namely grass, gravel surface and artificial
surfaces were chosen. To collect the data on the above said variables standard tests
were used in different surfaces. The total performance of the players were assessed
by subjective rating done by there experts. To compare the variables chosen on
different surfaces, ANNOVA technique was used. The following conclusions were
drawn from the study, the total performance of the university hockey players was
found better in the grass surface.

The total performance of state men hockey players was found better in the artificial surfaces.

The physical and performance variables of university men hockey players
were found better in the artificial surface and gravel surface.

It was also found out that the university men hockey players were better
in the performance variables in the grass surfaces.
**Franks** had developed a computerized sports analysis for field hockey either digital or graphical data of team performance, or the programme to control edit, the videotape of game action. The interactive video computer programme accessed the stored database, the times of all specified events such as goals, shots, set plays etc. This system was tested initially by the Canadian National women hockey team.

**Starke** had assessed the relative importance of attributes determined largely by the efficiency of the central nervous system versus cognitive attributes in the determination of expertise in field hockey. Three groups were assessed on a battery of field hockey related perceptual and cognitive tasks. Three groups were Canadian Women’s Field Hockey Team, a university team and a novice group. The attributes assessed were simple reaction time, dynamic visual activity, coincident anticipation, ball detection, speed and accuracy complex, decision speed and accuracy. Shot prediction accuracy both when ball impact was viewed and when it was occluded and recall accuracy of game structured and non-structured information. The multitask approach revealed the importance of cognitive abilities in the determinant of skill in field hockey.

**Harson** had conducted a test to determine the relationship of selected physical fitness variables (speed, power, cardiovascular endurance and agility) to performance in basketball players from the professional college of physical education as subjects and administered the AAPHER physical fitness test to collect the data pertaining to the selected physical fitness variables.

The result of the study of the study revealed that the agility cardiovascular endurance and power correlated significantly obtained value 0.7, 0.55 and 0.52 respectively; whereas speed did not show relationship to performance (obtained value is 0.08).

**Bhangu** had analysed the defending abilities of different International teams namely, South Korea, Australia, Kazakhstan, Malaysia, England, south Africa, Poland and India in Indira Gandhi Invitational Hockey tournament. The
purpose of the study was to investigate the ability of the team to save goals and their weakness to concede goals from different angles. The teams were divided into two pools. Each team played five matches. Data were collected for field, penalty corner and penalty stroke goals, conceded and saved by each team in all the matches played. Calculations were made in percentage in all the variables. Analysis of data showed difference in abilities of various teams to defend goals and also in their weakness to concede goals. The Indian team was poorest in defending penalty corner, but was best in penalty stroke defense. Australia team was strongest team in penalty corner defense and England team proved best in defending field tries.

**Glasgow** had carried out an observation of an Ireland versus England International hockey matches and found out the times the team lost taking free hits, hit outs, penalty corner, corner and goals. He also found out the time lost taken for total stoppages of play.

**Dhaliawal** had studied the physical load on wingers by analyzing the video recordings during the fifth world cup at Bombay 1981-82. He found that the physical load on a winger differed from country to country.

The system of play of continental countries and Asian countries were different and there was a significant difference in the physical load on the fight wingers of two systems. But no such difference was observed in case of physical load on the left-winger. He also stated that Indian right-wingers have more technical load as compared to Pakistan Wingers.

**Tiwana** had observed video recordings of 24 matches during the fifth world cup at Bombay in 1981-82. He studied the different types of passes and their contribution towards play in 5-3-2-1 and 4-2-4-1 system of play. There was a higher relationship among return, back and diagonal passes. The success rate of different types of passes in both the system was high. He concluded that each pass is good and its own importance in the two systems. The return pass was used more frequently by Asian countries and back by continental countries.
Singh had analyzed selected football matches of Asiad 1982 and world cup 82. The following parameters were considered for the analysis. They are: number of passes during a single ball possession, frequency of different type of passes, frequency of successful and unsuccessful dribbles, and frequency of the different types of fouls. The analysis revaluated that the lower frequency of higher number of passed in a single ball possession is suggestive of the fact that the Asian teams retained ball possession for a shorter duration as compared to the world cup teams. The world cup teams made more number of passes per match as compared the Asiad teams. Asiad teams used a higher percentage of forward passes. The Asiad teams dribbled less frequency than the world cup teams. The percentage of successful dribbling is marginally higher in case of Asiad teams where as world cup teams have higher average score of shots.

Withers had studied and determined the movement patterns of out field positions by analyzing complete game video tapes of five fullbacks 5 central defenders, 5 midfield players and 5 forwards and claimed that such and analysis has implications for the specificity of fitness training in soccer. Single factor ANOVA indicated that there was no statistically significant differences (FL or = 0.05) between 4 positions for the following distance traveled (overall mean + S); total (11527 + 1796 m); Walking (3026 + 533 m); jogging (5140 + 1440 m); striding (1506 + 584 m); striding and sprinting (2172 + 798 m); walking backwards (590 + 271 m), jogging backwards (285 + 239 m), moving sideward (316 + 135 m) and traveling with ball (218 + 101 m). There was statistically significant F-ratio for sprinting (666 + 311 m) and a Newman – Kelus post hock test indicated that the fullbacks (941m) sprinted significantly further than central defenders (396 m). He found that the most of the distance covered was therefore b the low intensity activities of walking (31.4 percent) and jogging (47.1 percent). High Intensity (striding and sprinting) accounted for only 18.8 percent of the total distances covered. The average time stationary of 85 sec (range = 14.9 – 198.5
sec) suggested that most of the high intensity work was initiated whilst the players were already moving.

**Ali and Farrally** had studied on the time spent by players of different position during walking, jogging, cruising, sprinting and standing still during match play activities. University level of players of age group 19-21 years were filmed in several matches and the video recordings were analyzed using a microcomputer. The ratio of the time spent for the players were 56 percent walking, 30 percent jogging, 4 percent cruising, 3 percent sprinting and 7 percent standing still. ANOVA revealed that there are significant differences among the players for different positions on field, for example the time spent for jogging; walking and standing still differed (p<0.05) among the attackers, defenders and midfielders.

**Reilly and Thomas** analyzed the video recordings for the total distance covered in different positional roles of England professional soccer players during match play. With the assistance of a stop watch and an elaborately mapped playing surface they recorded the activities as walking, jumping, running and sprinting three alternatives for the “non ball players” in offensive scenes; except four alternatives for the defender. The results of the study stated that the experienced players had performance superior to the less experienced players.

**Hughes and Charlish** developed computerized notation system for American football which was done after post event using video tapes of televised games. The structure of the analysis included the position of play, offensive and defensive formations prior to the snap of the ball, the action and the results of the play, longitudinal and lateral patterns of passing as per quarter, length of passing per quarters, fumbles, interceptions, and touch downs were analyzed. The system was validated by comparing the computerized results of one whole match with the data recorded by hand using slow motion replays to ensure accuracy. There was no significant difference between the two sets of results. An analysis of 329 offensive plays showed significant difference in the patterns of play winning and
losing offenses (P>0.05). The analysis also showed differences in patterns of play between the first half and second half possibly due to the input from the coaches during the half time. A significantly higher proportion of passing plays resulted in touch downs than did running plays.

**Hughes and Williams** analyzed and compared the Rugby and compared the Rugby matches of (1986-87) involving the French, Scottish and Irish with that of England and Welsh teams for the difference patterns of play by using computed aided analysis which was designated to notate the matches post-event using video tapes. No significant differences were found between the patterns of play of successful and unsuccessful teams, although a number of differences were found between the patterns of play when three nations were compared to the other two (P>0.05). The groups averaged nearly the same number of possessions per game (66 and 67 respectively), France, Scotland and Ireland passed the ball 87 times whilst England and Wales passed only 54 times. England and Wales ran with ball only 17 times compared to 27 times of France, Scotland and Ireland but favored a kicking strategy (45 vs 42 kicks on average). It was found that there was a difference of play between French, Scottish and Ireland compared to English and Wales with respect to number of passes, runs and number of ruckus, mauls set up and won.

**Rai** conducted an analysis of selected basketball matches of men team during Asiad 82. Seven team’s matches were recorded with a video camera at normal speed. For the analysis purpose, the parameters observed were frequency and type of shots, frequency and type of shots, frequency of passes and interceptions, violations, ball possessions and rebounding. It was found that top teams were able to secure more number of free throws and also had good percentage of their conversion. As far field goals were concerned, top teams used more percentage of lay up shots than the poor teams. In passes, two hand chest pass was used maximum times than other type of passes. Top teams had more number of ball possessions and less number of violations. In rebounding more
number of successful defensive rebounds was observed than the offensive rebounds.

**Han and Schutz** conducted a study to investigate the playing ability and characteristics of team performance in international men’s volleyball. The specific purpose were (a) to examine differences in playing characteristics (ie) the set and spike, between the attacks and counter attacks; (b) to examine changes in playing characteristics as a function of team success; (c) to determine the best predictor or a set to predictors or a set of predictors of team success among the selected skill of components. 72 sample games from the 3rd Federation of International Volleyball cup mens competitions were recorded, using computerized system. Six main skills in volleyball serve, serve reception, set spike, block and dig were selected as key elements that represent team performance. To quantify the effectiveness of each skill performance a five point rating scale with “0” representing an error and 4 representing a perfect execution was used. It was observed that the significant differences between teams standing and game outcome due to better performance on those skills used in the counter attacks. Among the six selected skills, the block and spike were the most important, in determining the team performance.

**Allen** measured the kinematics variables in successful high school (n=5) college (n=5) and professional baseball hitters (n=5). The age of the subjects ranged from 16 to 24 years, and all the subjects were considered successful based upon the previous batting averages. The purpose of this study was to compare the three groups in an attempt to identify the differences in the bat velocities. Each subject was video taped in the transverse plane, and these taps were analyzed for kinematic variables with the peak performance technology system. The results inferred that there was no significant statistical difference between school, college and professional batters.

**Miller and Edbrooke** studied the parallel processing performances of an international netball team and a school girl’s side and were assessed from video
tape recordings of three matches play at each level of competitions. The dependent variable was passing accuracy and the independent variable was the level of defensive pressure under which the passes were made. Due to the parallel processing demands inherent in the activity, it was hypothesized that passing accuracy would deteriorate under increase defensive pressure and this trend would be exaggerated at the school girl level. A two-way ANOVA failed to establish significant difference between levels of participation or defensive categories (P > 0.05).

Hughes hypothesized that players of high stand and will play further forward on the court than those of lower standard in squash game. The frequency distribution of all the shots of both recreational (n=12) and country (n=16) standard players were analyzed distribution of specific shots, drop shots, volleys, and volley drops were also examined in an attempt to explain the difference in positional patterns between the two set of players. No significant difference was found in these cases except for the recreational players were found to play significantly further forward than country players.

Singh carried out selected boxing bouts analysis of Asiad '82. A total of 49 boxing bouts of different countries were covered with a video camera. That is straight arm blows, bent arm blows, point and mark, direct attack, counter attack, feint attack and duration of contest. It was observed that the frequency of blows were more than the bent arm blows. The frequency of blows on the face is much higher than the frequency of blows on the body. As far as the frequency and type of successful attacks were concerned the number of feint attacks was more than the direct attacks. The counter attacks were minimum. Feint attacks were more in lightweight categories. The mean duration of contest in a round and about were between 55 to 100 seconds and 3 to 4 1/2 minutes respectively.

Pai analyzed the motion picture films of the stroking techniques employed by the finalists in 15 of 16 100m and 200m individual swimming event contested
in the 1982 British Common Wealth Games (Brisbane) to determine the stroke length (SL), stroke frequency (SF) and stroking speed (S) of five complete stroking cycles in each length of the race for elite swimmers of four competitive strokes; to compare male and female swimmers and to determine the relationship between SL, SF and S. Subsequent analysis of the data let to the following conclusion. The S of the four competitive strokes followed the descending order to butterfly, to back stroke, the breast stroke in 100m and 200m event in male and female swimmers. In all events SF was significantly higher than 200m events. The male swimmers had significantly longer SL’s than the female swimmers. In general the S decreased as event progressed. A significant negative correlation was found between SL and SF in all events except the 100m women butterfly.

**Sukumar** conducted a study on leadership and cohesion of the Indian and selected international men hockey team - A video analysis.

Indian men hockey team and selected international hockey teams which participated several international hockey tournaments between the year 1985 and 1990 had been considered for the purpose of the study. The teams selected for the analysis where India, Pakistan, South Korea, USSR, West Germany, England and Australia.

For the purpose of the analysis leadership and cohesion were chosen as variables. For the collection of data the investigator identified nineteen meaningful and measurable categories of leadership behavior simultaneously seventeen behavior models was complied for identifying cohesion. Four experts acted as judges for the collection of data. For the purpose of comparing the variables among selected teams “t” ratio was used.

The following results were obtained

1. Indian hockey team found better in decision making.
2. Indian hockey team found to be passing factors, demand response, interaction, facilitation, mastery over skills, and special judgment at a moderate level.
3. Indian hockey teams accepting the decision of officials, and goal attempts were at a very low level.

4. India was found to be poor in sense of appreciation, component of disciplining, perseverance unfailing truth, time management, goal keeping, attributes, technique and tactics play and behavior aspects.

5. Indian hockey team was prone to injuries.

Babu conducted a comparative study of performance of Argentina, and other countries in selected matches of world cup soccer championship in 1986. The result of his study showed that the Argentineans were good in all departments of the game that were selected for observation comparing to the other countries in the selected matches.

Muralidhar in his analytical study found out the performance of Indian hockey team with that of the other hockey playing nations in the Indira Gandhi Gold Cup International Hockey tournament held at Delhi in the year 1986. He analysed the data collected by using the percentage technique in the following parameters. Ball possession, different strokes, dodging, tackling and various types of attempts to score goals. He found out that India was very poor in scoring and finishing when compared with other countries.

Ramesh Rai, Ramesh Kelley and Hardayal observed basketball matches during Asian 1982. The parameters observed were throws and various field goals in a match. The result showed that certain differences between the teams and the poor teams which high light the modern trends in basketball in the international level tournaments. Top teams were able to secure more number of free throws with their tactical efficiency and had got good percentage of their conversion.

Ikeda conducted a study on a comparison of physical fitness of children in Iowa USA and Tokyo, Japan. He reported that Tokyo children scored better than Iowan (USA) children in pull ups (boys) bend-arm hand (girls) and the grass hopper (a test of endurance) while the Iowan children scored better in sit ups.
Berger and Parodies tested junior high school boys for physical fitness by the AAHPER youth fitness test. Data was collected for age, height and weight and socio economic level of each boy. Two racial groups were formed consisting of thirty white and black students and they were matched on age and socio economic level. It was concluded that the black students exceeded the white students significantly on the shuttle run, 0 yards dash, 600 yards run and composite fitness score.

A good performance in almost all games depends upon speed strength, agility, flexibility, endurance, co-ordination and power. Apart from these speed plays a major role in sprinting.

Alston made a comparison between the performance of girls on the Virginia physical fitness test, AAHPER youth physical fitness test and North Carolina physical fitness test. He found the correlations between the Virginia and the AAHPER test was 0.89, between AAHPER test and the North Carolina test 0.80. The mean difference gave essentially equivalent results for assessing physical fitness of high school.

Jamal and Ahmad conducted a comparative study on the physical fitness of secondary school students in Kuwait. He administered the AAHPER youth fitness test. The statistical analysis revealed that boys and girls in Kuwait had low levels of physical fitness.

Knuttgen conducted a partial determination of fitness, the youth fitness test of the American Association for Health, Physical education and Research. The test was given to 319 male and 135 female Danish school children. The results of the testing were compared with the American standards which were complied in terms of both age and the Nelson Cozens classification index it was found that approximately 70% of the boys & 86% of the girls exceeded the various American mean scores.

Shires conducted a research study of wrestling and soccer with regard to physical and cardio-vascular endurance. The result of this study was that wrestling
and soccer contributed significantly to improve cardio-vascular endurance but the gain is physical fitness was not significant and neither sports appeared superior to another.

Johnson carried out an investigation between student level of physical fitness and was to determine of Negro students differ significantly in terms of physical fitness and self concept from white students. He found that Negro students were superior to white student’s strength, cardio-vascular endurance, state of health, physical appearance, skill and sexuality. A greater relationship between physical fitness and self concept was found among whites than negro students.

Dhanraj studied the performance of Indian team and other teams in the following four major International hockey tournaments, namely Fifth World Cup hockey tournament (1982), Ninth Asian Games (1982), Round Robin League matches of Champions Trophy (1983) and league, semifinals and finals of 1984 Olympics. The study was conducted through video analysis. Variables such as strokes, ball possession, dribbling, tackling, attempts at goal, passes and infringements were analysed. The following conclusions were drawn: India gained ball possession most frequently through interception than other countries; India had more number of dribbling in attack area and had a success rate of 61.21%, whereas Pakistan had a lower number of dribbling but with a higher success rate of 67.33%, though India had the highest frequency of tackles as compared to other countries but the success rate was only 51.88%; India used more push strokes in attack area whereas Pakistan had more of hit strokes; Indians mostly used hit strokes in the mid field whereas push stroke was used by Australia, New Zealand, West Germany and Holland; India used more flick strokes as compared to other countries; India trapped the ball maximum in the 25 yard defense area as compared to other countries; Australians used the maximum scoop stroke; Indians success rate in return, diagonal, through and parallel passes was quite high; Pakistans success rate in forward and cross passes was higher than India;
Australia, Germany, New Zealand and Holland had a higher frequency of back passes. Pakistan made the highest goal attempts through field and penalty corners.

Pamila conducted a comparative study of performance of Indian hockey team along with other countries in selected International women’s hockey tournaments. For the purpose of the study, the countries namely, India, China, Japan, Singapore, South Korea and Khazakstan which participated in the Asian Championship and Asian Games hockey tournament were chosen. Further, the following performance variables were chosen for analysis. They were infringements, passes, ball possession, strokes and attempts at goal. For the purpose of collection of data, the matches were viewed on the video monitor at normal and slow speed as required, to enable the investigator and her colleague to properly observe. All the matches were recorded by various sports agencies from direct telecast of Doordarshan New Delhi and Prime Sports of Star TV net work. To compare each team on the chosen variables, one way ANOVA was employed. On the basis of the statistical analysis, she found that India committed less number of infringements when compared to other countries; India frequently gained and lost ball possession through interceptions as compared to other countries. Pushing skill was used frequently by India in the 25 yards attack area whereas South Korea used hits more in this area. India used hit frequently in midfield whereas other countries used push in midfield. Flick stroke was commonly used by India as compared to other countries. Other countries used more back passes to retain the ball possession than India. India gained maximum number of penalty corners and penalty strokes than other countries but the successful conversion rate was less for India than other countries. India was poor in midfield play whereas other countries build up the game from the midfield.

Leory made a comparative study of physical fitness level of seventh grade boys before and after planned physical educations programme the testing device was the youth fitness test. To measurement was made an arm and shoulder
girdle strength abdominal strength, speed, agility, flexibility, skill and co-
ordination and cardio vascular efficiency. Comparison of the initial and final
scores of the seventh students revealed an improvement in each test and each
component in physical fitness. It is recommended that more emphasis be given in
schools to plan programmes of physical education for a desirable physical
development.

Palanisamy conducted zig-zag run of the Barrow motor ability test in
1987 between kho-kho and kabaddi players to find out agility. He restricted the
study to thirty students and concluded that the kho-kho players were had better
agility than kabaddi players and led significance in scores.

Venkateswarlu conducted J.C.R. test in 1989 between urban and rural
pupils to find out the strength, speed endurance and agility. The investigator
restricted the study to thirty students and concluded that the urban school pupils
were better in performance than rural school pupils and had significance in scores.

Varnin says fast reactions are characteristics of great athletes in most
sports. To judge skill a basketball is thrown by good picker who has a curve ball
requires extremely fast reactions and most outstanding hitters who have been
tested for this quarterly are found to react very quickly in comparison with
ordinary players.

Hiesendager conducted a study to determine whether exercises designed
specifically to develop strength and speed were as effective for improving agility
as exercises designed to develop agility. The 83 male university subjects were
separated into five groups with one group each participating in exercise designed
to improve agility, speed, strength and the remaining group participating in
lectures. Thirty one tests were administered before and after participation in the
six-week programme and data were analysed by the analysis of co-variance
technique. The group participating in agility exercises demonstrated statistically
significant superiority over one or more of the other groups on four of the seven
agility tests. The only other group which demonstrated superiority on any of the
agility test were the speed group on the 10 sec squat thrust test and the control group on the right boomerang test, these by leading to the conclusion that agility can best be developed in programs designed specifically for that purpose and consequently that a unique factor of agility does exists.

To determine the relationship between multidimensional performance characteristics and level of performance in talented youth field hockey players, elite youth players (n=38, means age 13.2 years, s=1.26) were compared with sub-elite youth players (n=88, mean age 14.2 years, s=1.26) on anthropometric, physiological, technical, tactical and psychological, characteristics. Multivariate analyses with performance level and gender as factors, and age as the co-variety, showed that the elite youth players scored better than the sub-elite youth players on technical, tactical, and psychological variables. The most discriminating variables were tactics for possession of the ball, motivation and performance in a slalom dribble. Age discriminated between the two groups, indicating that the elite youth players were younger than the sub-elite players. In the guidance of young talented players to the top as well as in the detection of talented players, more attention has to be paid to tactical qualities, motivation and specific technical skills.

Sreenivasa Reddy conducted a comparative study on the analysis of selected physiological and motor ability components among the college soccer, hockey and handball players. For the purpose of this study he has selected 30 football players, 30 hockey and 30 handball players from university arts and science college and their age was 18-25 years. The physiological variables and motor ability components were measured ad recorded. One way analysis of variance was used to find out the overall significant difference. It was found that

1. The college soccer players had a greater agility, speed and cardio-respiratory endurance than the hockey and handball players.

2. College hockey players had greater agility, speed and cardio-respiratory endurance than the handball players.
3. The college soccer players had a lesser pulse rate than the hockey and handball players.

**Dunn and Fait** conducted a comparative study of physical qualities of defensive and offensive football players. Agility, speed, strength, endurance height and weight were compared and statistically analysed by using ‘’t’’ ratio. The results of the study were as follows.

1. Defensive players are heavy, taller and have more muscular power than offensive players.
2. Offensive players are faster and have more endurance than defensive players.
3. There is no significant difference between offensive and defensive players in agility.

**Madhavan** conducted a study to compare the physical and anthropometric variables at men university hockey players from the universities of Tamiladu, Andhra and Kerala States. Ninety university men hockey players comprising thirty university players from each states who had participated in the inter university south zone tournaments during the year 1992-93 were selected as subjects. The selected physical variables were agility, power and arm strength, anthropometric variables were height, weight and arm length. ANOVA and Scheffe’s post hoc test was used. The conclusions arrived at were (1) Andhra university hockey players are better in agility and the Kerala university hockey players are better in arm strength as far as power and height are concerned and there was no difference among the university hockey players at all the three States. The Tamilnadu university hockey players are better in weight and arm length.

**Sewell and Edmondson** examined relationship between pre competitive state anxiety and field position in a sample of 121 soccer and field hockey players-pre game state anxiety was measured by use of the competitive state anxiety inventory (Martens, Vealey and Burton 1990) 30 minutes before the start
of a university level game. Analysis of the data revealed that goalkeepers had significantly higher levels of cognitive anxiety than players on other positions and were also more somatically anxious and self confident than defenders of outfield players, midfield and forward players were more somatically anxious than defenders and midfield players were less of self confident than defenders. There were no significant differences on any of the measures between midfield and forward players nor were there any main sports effects. There were no significant gender differences on cognitive or somatic anxiety, but males were overall, more self-confident than females.

**Jayashree Acharya** conducted a study on the position wise analysis of cognitive worry, somatic tension and self-confidence of women hockey players. She had chosen 113 female hockey players who participated in All India interuniversity hockey championship, 1992 (first eight teams) were divided into three categories according to their playing positions i.e. forwards (N=52) Midfielders (N=27) and defenders (N=34). They were tested for three components of competitive state anxiety cognitive worry, somatic tension and self confidence, a day before they were to play their fixtures. The analysis of variance computed from the data so collected on the three positions of player’s has indicated that no significant difference was among them.

**Radha** conducted a study on psychological factors and soccer performance of south Indian university players. In this study, psychological factors namely aggressiveness were studied in relation to soccer playing ability. Accordingly 100 south Indian university soccer players from state of Tamilnadu, Kerala, Andhra Pradesh and Karnataka were selected. Aggressiveness test questionnaire (AD) developed by Rainer Marten and Smith to measure aggressiveness was adopted. Experts subjectively rated the soccer playing ability of the subject’s (0 to 10 point scale) on a 10 point rating scale.

The obtained factor on the psychological factor was correlated with the soccer playing ability using Pearson’s product moment correlation and partial
correlation to eliminate the influence of the third variable. It is traced from the result that there was a negative correlation between playing ability and aggressiveness. Aggressiveness was highly correlated with soccer playing ability at significant level. The result of this investigation revealed that moderate level of aggressiveness more present among the south Indian inter-university players.

Reiner conducted a study on how individuals perceive instrumental aggression and assertive behaviours in hockey and baseball. The purpose of this investigation was to determine, through an attribution analysis, how individuals perceived scenarios which described instrumental aggressive acts and assertive acts in sport. Results indicated that individuals who used instrumental aggressive acts in baseball were perceived as being responsible for the behavior and should receive punishment. The aggrieved against player in baseball would feel more common than in baseball. The findings of this study indicated that the more aggressive a sport is (such as hockey), the less likely individuals are to attribute responsibility to the players for aggressive acts.

Engelhard and George conducted a study to assess a relationship between aggression behavior and winning games in the national hockey league (NHL) summaries from five consecutive seasons (1987-1992) were examined. At this time the NHL has 21 teams divided into two conferences the Wales and Campbell. Spearman rank order correlation tested for no relationship between teams, total number of aggression penalties and final league standings. Analysis of the relation between a team’s number of major aggression penalties and final league standings (based on team points for wins, losses and ties) gave four significant negative correlations indicating a substantial inverse relationship (i.e. the larger the number of fights the lower the final standings tended to be) although significant positive correlation was obtained for those teams finishing in the bottom half of the standings. Results question the popular belief that aggression and winning N.H.L. Games are favourably associated.


**Mc Guire et.al.** conducted a study on aggression as a potential mediator of the hom advantage in professional ice hockey. Based on the subject defined deliration between aggressive and non aggressive ice hockey. Penalties established by Widmeyer and Brich, 13 measures were used on data collected from the official game reports and penalty records of the national hockey league for the 1987-1988 season. Both Macro analytic and micro analytic research strategies and analysis were employed. Initial analysis revealed that home team won 58.3 percent of the decided games. Further analysis showed a significant interaction between game location and performance. Home team incurred more aggressive penalties in game they won whereas visiting teams incurred more aggressive penalties in games they lost.

**Rosentiwieg** conducted a study on perceived exertion of professional hockey players. 18 professional hockey players were tested on the treadmill with a modified Bale procedure and also for maximum isokinetic strength with the Cybex II instrument. Immediately after each test the subject completed the Borg Scale of Perceived Exertion. The treadmill effort was perceived as being “somewhat hard work” while the maximum strength effort was considered “very light”. This conflicts with previous literature. I may be that [professional hockey players adopt To physical stress and do not respond perceptually to such stimuli in a typical manner.

**Hermiston** conducted a study to compare the test results times of 3 diferent hockey skills with the individual players ratings of coaches. By making these comparisons to the control rating, each test was evaluated as a predictor of hockey ability. The hockey players were all between the ages of 12 and 20 years of age and all 90 layers were competitive team players. The three hockey skill tests were the Illinois Agility Skate, the Finnish Skills Test and the Hermiston Hockey Ability Test. Each player was allowed 3 trials and the best times were recorded in all cases. The preliminary results indicate that the Hermiston Hockey Ability Test was the best predictor (r=7) with the results of the other two tests concluded that in
a competitive team of hockey player’s ability can best be assessed by using Hermiston Hockey Ability Test. The two other tests were not as successful in their prediction of ability when compared to the criterion variable of coaches’ ratings.

Terry conducted a study on discriminate effectiveness of psychological state measures in predicting selection during field hockey trials. Field hockey players (N=128) completed the Competitive State Anxiety Inventory-2 and the Profile of Mood States about 45 min. before a British Universities trial. Single factor multivariate analysis of variance indicated no significant differences between selected and non selected players for any preperformation mood or anxiety measure. Discriminate function analysis showed that 74 participants (57.81%) could be correctly classified as selected or non selected players on the basis of preperformance mood scores. This figure rose to 83 participants (64.84%) when scores on the anxiety subscales were also included in the discriminate function analysis. Anxiety scores alone discriminated 71 participants (55.47%). These results occur with earlier proposals of terry that psychological state measures decline in predictive effectiveness in long duration, open skill team sports.

Kriz conducted a study on the impact of psychological stress on somatic and Bio-chemical parameters in an typical sports discipline. The subject of our interest was to investigate the response of the organism to mental strain in a typical sports discipline. To this end we examined 10 chess players. We assessed their pulse rate at rest, before a contest, immediately after the contest and after 5 minutes recovery. Statistical evaluation revealed an increased heart rate before the contest as compared with rest at a level of significance of 0.01; after the contest as compared with the status before the contest at a level of 0.02; in the recovery stage, as compared with rest, at the 0.01 level. As a control group we examined 10 hockey players under the same conditions and the results were compared with the chess players. For scientific practice it is necessary to find a way to monitor the internal environment during a chess game (catecholamine,
lactate, glucose, fatty acids, cholesterol and others). As soon as this will be possible without disturbing the information on the adaptation of the organism to mental strain during a game of chess.

Mc Carthy and Kelly conducted a study on aggression, performance variables and anger self-report in ice hockey players. This study partially replicated a former one showing a relationship between aggression and performance among hockey players. With certain penalties used as a measure of aggression, two groups of male college ice hockey players were compared for differences in goals and assists those rated high in aggression. The direction of differences in assists was the same but did not reach significance. When the same groups were compared for shots on goals, significant differences were found, favouring the high aggressive group. This finding was discussed in light of energy output and efficiency. Attempts to relate performance and personality measures were not successful when comparisons on a self-report measure of anger were analyzed.

Samuel Sabre conducted a study on comparative analysis of selected physical and psychological characteristics of men soccer players playing at different field positions. For the purpose of the study 120 soccer men players who participated in the South Zone All India Inter University competition were selected as subjects. The following physical variables namely speed, power, endurance and following psychological variables namely anxiety. Self-confidence, aggression, co-operation and cohesiveness were chosen. To conduct the study different field positions were taken namely goal keeping. Full backs, half backs and forwards. To collect the data on the above said variables, standard tests were used and standard questionnaire were also used. One way analysis of variance technique was used to compare the different variables chosen. The following conclusions were drawn from the study. There was no difference among the players at different field position in speed level. Full back men soccer players were having more power than the other field positions. There was no difference among
the players in the anxiety level. There was no difference among the players in the self confidence level and there was no difference among the players in the aggression level.

Schutz conducted a study on academic achievement and involvement in hockey a post-hoc longitudinal study. Academic achievement, absenteeism and athletic involvement (hockey) data were collected on 484 boys throughout British Columbia. School and minor hockey records were used to obtain longitudinal data for each boy from Grade I until high school graduation or school withdrawal. Results indicated that hockey players exhibit less school absenteeism than non hockey players, but are not different with respect to grade point averages. Hockey players, at the juvenile level or lower, tend to attain a slightly higher grade point average during the years they are playing hockey in comparison with their academic achievement during the years they are not playing hockey. Of the hockey players with lower than average I.Q.’s those who exhibit poor achievement tend to drop out of hockey earlier than those who have average or above average grades.