CHAPTER II

REVIEW OF RELATED LITERATURE

According to Good “review locates comparative data useful in the interpretation of the results.” John W. Best (1968) remarks that “a familiarity with literature in any problem area helps the student to discover what is already known. What method have been promising or disappointing and what problem remains to be solved, etc.” A literature review enables a researcher to accomplish a number of more specific aims. It is likely, for example, that in the early stages of research the researcher may have only a vague idea of the area the researcher would like to explore vastly. The researcher may have only a tentative outline of the research problem. A review of the related literature will help the researcher to focus his tentative problem by both limiting and defining more clearly the topic he is interested in researching. The researcher will be aware of possible pitfalls, or search questions that have been thus far neglected reading around the subject will help the investigator to distil the issues he wish to concentrate upon and leave him with a concise, detailed and distinct plan of action.

A literature review is a body of text that aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and as such, do not report any new or original experimental work. Most often associated with academic-oriented literature, such as a thesis, a literature review usually precedes a research proposal and results section. Its ultimate goal is to bring the reader up to date with current
literature on a topic and forms the basis for another goal, such as future research that may be needed in the area. A well-structured literature review is characterized by a logical flow of ideas; current and relevant references with consistent, appropriate referencing style; proper use of terminology; and an unbiased and comprehensive view of the previous research on the topic.

Review of related literature decides, allowing the researcher to acquaint himself with current knowledge in the field or area in which he is going to conduct his research, serves the following specific purposes.

- The review of the related literature enables the researcher to define the limits of his field. It helps the researcher to delimit and define his problem. The knowledge of related literature, brings the researcher up-to date on the work which others have done and thus to state the objectives clearly and concisely.

- By reviewing the related literature the researcher can avoid unfruitful and useless problem areas. He can select those areas in which positive findings are very likely to results and his endeavors would be likely to add to the knowledge in a meaningful way.

- Through the review of the related literature, the researcher can avoid unintentional duplication of well-established findings. It is no use to replicate a study when the stability and validity of its results have been clearly established.

- The review of related literature gives the researcher an understanding of the research methodology, which refers to the way the study, is to be conducted. It helps the researcher to know about the tools and instrument, which proved to be useful and promising in the previous studies. The
advantage of the related literature is also to provide insight into the statistical methods through which validity of results is to be established.

- The final and specific important reason for reviewing the related literature is to know about the recommendation of previous researchers listed in their studies for further research.¹

The researcher made a systematic attempt to review the related literature by keeping the aforesaid points in mind. The researcher reviewed the some detailed in the following studies:

**Khan, Ahmad and Khan (2011)**², Sports Achievement Motivation and Sports Competition Anxiety: A Relationship Study. Anxiety and Motivation are important psychological variables in sports and its need to achieve high level of competition. Without knowledge of these two variables athletes cannot give best in competition. The aim of study was to find out the relationship between Anxiety and Motivation of intervarsity Badminton players. The total sample consisted of twenty players age ranged from 17 to 25 years. Sport Competition Anxiety Test (SCAT) and Sports Achievement Motivation Test was administered to collect the data. Mean, standard deviation, and Pearson’s Product Moment Correlation were computed to analyze the data at .05 level of significant. It was found that significant negative relationship between Achievement Motivation and Anxiety. From the result of the study it was concluded that there was significant negative relationship between Achievement Motivation and Trait Anxiety at .05 level of significant i.e. Study

showed that increase or decrease of level of Achievement Motivation do effect on the Increase or decrease of level of Anxiety or vice-versa. Therefore we can say that players who have high level of Anxiety should also have low level of Achievement motivation or vice-versa. Result of the study endorses the findings of Bawa and Kalpana (2001) who conducted the study on male national level Gymnasts and found that higher level performance group has moderate level of anxiety than the low level performance group., Unierzyski (2003) investigated the level of achievement motivation of young tennis players and their future progress and examine the influence of achievement motivation on tennis performance. He found in his study that the players who later reached international level in tennis possessed significantly higher level of achievement motivation than the players who never reached international level.

Patel; Gohel and Alf (2011). Relationship of Physical Variables, Physiological Variables and Body Compositions to the Sprint-Starts. The purpose of the study was to determine the relationship of physical variables i.e. standing broad jump, flexibility) physiological variables (anaerobic capacity, resting pulse rate, vital capacity) and body compositions (lean body mass, total body weight, height, biceps, triceps, sub scapula and supra iliac skin fold) to the sprint starts. Twenty male students of under graduate and post - graduate classes of L.N.I.P.E., Gwalior, were selected as subjects. For measuring these physical, physiological variables and body compositions following tests were employed: sprint starts were measured up to 50 m from

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starting line and the performance was recorded in seconds; explosive strength was measured by the standing broad jump, and the performance was recorded in centimeters; flexibility was measured with the help of seat and reach test and the performance were recorded in inches; anaerobic capacity was measured by the help of Margarita Calamine power test in the unit of kg. m/sec; resting pulse rate was measured by the help of stop watch and recorded in number of beats per minute; vital capacity was measured by the help of wet-spirometer in the unit of liters; lean body mass was calculated by subtracting the fat weight from the total body weight; total body weight was measured by the help of weighing machine in the unit of kilograms; he height was measured with the help of height steadiometer in centimeters; body fat was estimated by the help of skin fold caliper (bicep, triceps, sub scapula and supra iliac) and the fat weight was measured by calculating percentage of the body fat with the help of skin fold caliper, taken namely biceps, triceps, sub scapula and supra iliac in millimeters and then weight of the fat was calculated on the basis of the total body weight of the individuals subjects. Product movement correlation was used to compute correlation between sprint starts (50m run) and each of the selected independent variables i.e. explosive strength, flexibility, anaerobic capacity, resting pulse rate, vital capacity, lean body mass, body weight, and height. For testing the hypothesis, the level of significant was set at 0.05 level. The finding of the study indicated that standing broad jump (Explosive leg strength) had significant relation to the sprint starts and co-efficient of correlation was 0.611. Further the co-efficient of correlation between sprint starts and flexibility, anaerobic capacity, resting pulse rate, vital capacity, lean body mass, body weight and
height were 0.260, 0.413, 0.275, 0.229, 0.308, 0.181 and 0.260 respectively, these values indicated insignificant relationship.

Ibrahim and Gwari (2011)\textsuperscript{4} A Study of Achievement Motivation of Low and High Level Volleyball Players. The aim of the study was to examine the relationship of Sports Achievement Motivation of volleyball players. A group of (N=50) male subjects divided into two groups (N=25 high performers) and (N=25 low performers) were selected for this study from rural games mela held at Mendhar tehsil of Jammu and Kashmir State. Their age range of the subjects was 25 to 30. It was hypothesized that there may be significant differences with regard to achievement motivation among low and high performers. The ‘t’ test was used to analyze data. The achievement motivation scale by Kamlesh (1990) was used to assess the differences among the low and high performers. The level of p < .05 was considered significant. Results indicated that significant relations were found between high/low performers. On the basis of the result of the present empirical investigation it is concluded that significant relations were found between sports achievement motivation and low and high performance of volleyball players. These results may be corroborated with the findings of Rathee and Singh (2011) they observed that the differences between the two performance levels i.e. national and international have been found to be significant. These results provided evidence that high achievement motivation is an important factor that distinguishes high level performers (Butt and Cox, 1992).

Singh Sisodiya and Purashwani (2011) Relationship between Achievement Motivation and Anxiety of Shuttlers. The Purpose of the study was to investigate the relationship between achievement motivation and anxiety of inter-university level male and female shuttlers i.e. badminton players. For this purpose, 30 (15 males and 15 female) shuttlers were randomly selected as subjects, who participated in west zone Inter-University Badminton Tournament. Sports Achievement Motivation Test by M. L. Kamlesh and Sports Competition Anxiety Test constructed by Rainer Marten were administered to collect the data. Pearson’s Product Moment correlation was employed to find out the relationship between achievement motivation and anxiety. Findings showed no significant relationship between Achievement Motivation and Anxiety of male and female badminton players of Inter-University level. From the findings it is very much evident that the score of Coefficient of correlations between achievement motivation and anxiety of male and female shuttlers was observed, was not significant (Ho rejected) as the value required being significant at 0.05. This insignificant relationship may be attributed due to the fact that the inter-university level badminton players were highly trained and belong to elite group of sportsman. They were exposed to higher level of participation and they were having balanced anxiety level with high achievement motivation. They were highly focused for accomplishment of their goals so they have shown insignificant relationship with anxiety.

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A study of pre and post-competitive anxiety level of inter-university basketball players. The present study compares the pre-competitive and post-competitive anxiety in inter-university basketball players. A group of 30 players (15 of each sex with age group of 18-25) were selected from Amritsar, Punjab, India through purposive sampling technique. Data were collected from athletes using a Sports Competitive Anxiety Test. The result of the study reveals that there was significant difference in 0.01 levels of pre-competitive anxiety and post-competitive anxiety among the male and female inter-university basketball players.

To Develop Physical Profile of Kabaddi Players: The Descriptive Study. The purpose of study was to develop the physical profile of Kabaddi players. 100 male Kabaddi players were selected from West-Zone Inter-University championship as the subjects of the study. Their age ranged between 18 to 23 years. Keeping the feasibility in mind speed, agility & explosive power had been selected for this study. Speed & agility were assessed by administering 50 yard dash and the performance was recorded in seconds & shuttle run respectively. To determine for the explosive power, standing board jump was used and the reading was recorded in meters. To develop the physical profile of Kabaddi players, descriptive analysis was applied. The results of study indicates that in case of 50 yard dash, standing broad jump and shuttle run Kabaddi Players were having

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average in scores. In case of standing broad jump kabaddi Players scored above average. It was concluded that West-Zone University Kabaddi players were average in speed and shuttle run and in case of standing broad jump were above the average. In this light of the findings, it was concluded that West Zone University Kabaddi Players were having average timing in speed. It was concluded that West Zone University Kabaddi Players scored average in agility. And it was also concluded that West Zone University Kabaddi Players scored above the average in explosive power.

Koley; Singh and Sandhu (2010). Anthropometric and physiological characteristics on Indian inter-university volleyball players. The purpose of this study was of two-folds, firstly, to evaluate the anthropometric profile of Indian inter-university volleyball players and, secondly, to search the correlation of body mass index, % body fat, hand grip strength (right dominant) and Vo2max. with other anthropometric characteristics studied. Eleven anthropometric characteristics, four body composition parameters, two physical and two physiological variables and nine arm anthropometric characteristics were measured on randomly selected 63 inter-university Indian volleyball players (38 males and 25 females) aged 18–25 years from Guru Nanak Dev University, Amritsar, Punjab, India with adequate controls (n = 102, 52 males and 50 females). The results indicated that male volleyball players were taller (6.63%) and heavier (7.31%) and female volleyball players were slightly taller (0.31%) and lighter (3.74%) than their control counterparts. One way analysis of variance showed significant (p=0.004-0.000) between group

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differences in all the variables (except hip circumference) between volleyball players and controls. In volley players, significantly positive correlations were found with BMI and other 19 variables, with percent body fat and 6 variables, with right hand grip strength and 20 variables and with Vo2max and other 19 variables, and significantly negative correlations were found with percent body fat and other 16 variables, with right hand grip strength and other 7 variables and with Vo2max with other 8 variables. The findings of the present study might be useful in future investigation on player selection, talent identification in volleyball and training program development. Anthropometric and morphological characteristics play a vital role in determining the success of sportspersons (Rico-Sanz, 1998; Wilmore & Costill, 1999; Keogh, 1999). Specific physical characteristics or anthropometric profiles are required for the highest level of performance in a specific sport (Claessens, Lefevre, Beunen, & Malina, 1999; Bourgois et al., 2000; Reilly, Bangsbo, & Franks, 2000; Gabbett, 2000; Ackland, Ong, Kerr, & Ridge, 2003; Slater et al., 2005).

Koley, Singh & Kaur (2010). A Study of Arm anthropometric profile in Indian university basketball players. The purpose of this study was threefold: firstly, to evaluate the arm anthropometric profile of Indian inter-university basketball players; secondly, to search for the correlations among these arm anthropometric characteristics; and thirdly, to search for the association of handgrip with arm anthropometric characteristics in Indian inter-university basketball players. Three anthropometric characteristics, nine arm anthropometric characteristics, and grip strength of both right and left hand

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were measured on randomly selected 60 Indian inter-university basketball players (35 males and 25 females, aged 18–25 years) of six universities, who participated in the Inter-university Championship organized at Guru Nanak Dev University, Amritsar, Punjab, India. An adequate number of control subjects were also taken from the same place for comparisons. The results indicated statistically significant (p = 0.05 - 0.01) differences between the male basketball players and the controls in height, right handgrip strength, upper arm, forearm and total arm length, whereas no significant differences were found between the female basketball players and the controls. Highly significant (p = 0.01) sex differences were found in the basketball players in almost all the variables studied (except BMI and arm fat area). Significant positive correlations were noted among the arm anthropometric characteristics studied (except arm fat area and arm fat index), and with right and left handgrip strength. Among these, physical abilities exert marked effects on the skills of the players themselves and the tactics of the team. In the basketball game, the upper arm and the forearm generate adequate force with the contraction of the shoulder and arm muscles. Arms act like a leverage and the integrity of the shoulder and elbow complexes completes the desired task. There is more movement possible at the shoulder joint than at any other joint in the body. Over 1600 positions in three dimensional space can be assumed by the shoulder. The price to be paid for such an extreme range of movement is an inherent lack of stability. To achieve peak performance during overhead activity, there must be optimal balance between mobility and stability.
Patil (2010), conducted a study on the relationship between Psychological Variables and Playing Ability among the University Level Kabaddi Players. The purpose of the study was to find out the relationship between psychological variables and Kabaddi playing ability among the university level men kabaddi players. Forty Kabaddi players representing different colleges of Karnataka University, who participated in inter-collegiate Kabaddi championships, were selected as subjects. The dependent variable was Kabaddi playing ability and the independent variables were selected psychological variables. Kabaddi playing ability was determined through the 10-point scale at the time of competition. Psychological variables included achievement motivation, anxiety, self-concept and aggression. The data was statistically analyzed using Karl Pearson's correlation coefficient and multiple regression analysis using SPSS. The following conclusions were drawn: among the psychological variables, achievement motivation and self-concept were related to kabaddi playing ability and anxiety and aggression were not found to be significantly related to kabaddi playing ability.

Kanwaljeet, Mandeep and Mandeep (2010) investigated on Anthropometric measurements, body composition and physical parameters of Indian, Pakistani and Sri Lankan field hockey players. This comparative study was conducted to determine the anthropometric measurements and body composition of field hockey teams of India, Pakistan and Sri Lanka. A total of 53 field hockey players from three teams were studied. The participants’


height was measured using the standard anthropometric rod, while their weight was measured with a portable weighing machine. Widths and diameters of body parts were measured using digital caliper. Girths and lengths were taken with a steel tape. Grip strength was measured with a hand dynamometer. Skinfold thickness measurements were taken using the Harpenden caliper at 4 sites (biceps, triceps, subscapular and suprailliac). The percentage of fat was calculated from the sum of 4 measurements of skinfold thickness. It was found that there were no significant differences in height and weight among the three teams, with the Pakistani players recording a slightly higher weight. The Pakistan team had a significantly higher upper arm length (p<0.05) and bi-humerus diameter (p<0.05) as compared to the India and the Sri Lanka teams. The Sri Lanka team had significantly less wrist circumference (p<0.05), hand width (p<0.05) and lean body mass (p<0.05) as compared to the India and the Pakistan teams. The India team had significantly less % body fat (p<0.05) than the other two teams. More data would be of interest to document the changes in anthropometry and body composition during the season and out of season and also to attempt an analysis of characteristics specific to field positions.

Kalidasan (2010)\(^2\) compared the Sports Achievement Motivation Level among different Topography of Ball Badminton Players. Ball Badminton is basically a south Indian game. It is a long duration game, so the players have to be fit mentally. The most successful people would be those who coupled strong achievement motivation with strong competitive motivation. In any

game the need for achievement is more important for all participants. To achieve the purpose of this study thirty students per each region, totally one hundred and twenty students were selected, and their age ranged between 18 and 24. The data was collected during All India Ball Badminton tournament for women organized by Bharathidasan University, Trichy during from 09th to 13th January 2009. The subjects achievement motivation was measured through the Kamlesh sports achievement motivation questionnaire. To test the significance of the mean difference at different topography namely north, south, east and west analysis of variance (ANOVA) was used. In case of any significance of mean difference among the regions, to find out which pair of group was better among the others, the Neuman Keuls post - hoc test was applied. The results show that there was a significant difference on sports achievement motivation level at different topography. South region players having the higher sports achievement motivation level followed by east, west and north.

**Bal; Singh and Singh (2010).**

Achievement Motivation and Locus of Control of university level individual and team sport players- A prognostic study. The aim of this study is to find out the significant differences among the players of individual and team sports, on the variable achievement motivation and locus of control. A group of three hundred and fifty (N=350) male players of individual and team sports, aged between 20 to 25 years were purposively selected for this study. They were further divided into two groups: A (individual game) and B (team game). It was hypothesized that there may not

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be significant differences with regard to achievement motivation and locus of control among individual and team game players. The significance between group differences were assessed using the student’s t-test for dependent data. The level of p < .05 was considered significant. Significance between group differences were found among the players of individual and team sports on the variable achievement motivation whereas no significance between group differences were found among the players of individual and team sports on the variable locus of control. Considering the various parameters as applied on different sets of subjects the results prove to be variant in nature and scope in relation to achievement motivation whereas results prove to be identical in respect to locus of control.

Navaneethan, and Rajan (2010), Effect of Progressive Muscle Relaxation Training on Competitive Anxiety of Male Inter-Collegiate Volleyball Players. The study was mainly concerned with volleyball players who participated in the high level competition. Now days, the Game volleyball is becoming as a professional sport rather than the competitive sport. So the competitiveness among the volleyball players is growing up day by day with different color. Reason for such competitiveness is arise naturally among the players, because of pressures such as equal competition, concern about fulfilling the expectation of their teachers, coaches, parents and peer group and personal needs. The present study investigated the effect of psychological skill training techniques such as progressive muscle relaxation on competitive anxiety. The three sub-scales of competitive anxiety were also examined;

cognitive anxiety, somatic anxiety and self-confidence. The study consisted of 24 male volleyball players from PSG College of Arts and Science, Coimbatore. Their age ranged from 18 to 25 years. The Competitive State Anxiety Inventory-2 (CSAI-2), also developed by Martens, Vealey, & Burton (1990) were used. Subjects were randomly assigned to either a relaxation training experimental group, or a no relaxation training control group. Both the experimental groups were given training for 3 days a week and for 6 weeks in total. Paired t-tests were used to test the effect of treatment groups individually between pre and post -tests of all the groups on variables used in the present study. The result of the study reveals that there was significant difference in 0.05 levels of competitive anxiety among the male inter-collegiate volleyball players.

Narahatti and Srinivas (2009), 15 Compared the Study on Anxiety Behaviour of Sportsmen. The purpose of study was to investigate the influence of nature of game on anxiety behavior of sportsmen. For this study 100 players were selected from south west zone inter University Basket ball and kho-kho championship by simple random sampling technique. The age of the subject ranges from 18 to 25 years. Sports Psychological variable that is ‘Anxiety behavior’, which was measured through standardized questionnaire developed by Prof. Sinha. This questionnaire were Administered on Inter-University representing players, to collect the necessary data. The data was analyzed using ‘t’ test, the study revealed that, the nature of game have significant influence on eliciting anxiety behavior among the players.

and A Study of the Psychological Factors, Anthropometric Measurement and Physical Fitness of Selected University Players in Gujarat, Shodh, Samiksha aur Mulyankan. The players are creating and breaking new records in today’s competitive sports. Traditionally the motto of Olympic festival is faster, higher and stronger is still alive in the field of physical education and sports. The aim of games and sports is fastly suited with every field. The old records are not remaining on boards they are establishing time to time. The level of physical fitness and motor ability is increasing day to day because of development of science and technology. Today’s Athletes are trained scientifically the equipments of training are also developed scientifically the ‘dand-bethak’ and ‘akhadas’ activities become out dated and hi-tech gymnasium and health centers takes its place. Now a day in training the physiotherapist entered with traditional ‘gurus’. With the help of physiotherapist and psychologist fitness of individual players is modified increase. The modern coaching methods are prepared for the development of physical fitness, psychological ability and anthropometry. From the study of Psychological Parameters revealed that, the players of all games were seen reserved, critical, cool, emotional, mild, easily upset, conforming, accommodating, sober, prudent, serious, shy, timid, trusting, tough minded, confident serene, self-reliant, affected by feeling.2-In parameters if psychological factors kabaddi’s players were shown more significant as compared to other games, while volleyball players were for away from these factors.3-The results from the analysis of anthropometry measurement the

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players of Kabaddi's highest in Height, Weight and circumference of chest, upper arm, thigh and calf, were as players of kho-kho's has shown lower in above sighted variables. The results revealed from analysis of physical fitness Athletics players were superior as compared to other games, where as basketball players were lowest

Ali and Sharma (2009)\(^\text{17}\) studied on A Comparative Study of anthropometric Variables between Medalist and Non-medalist Football Players. The present anthropological investigation was conducted on inter college and inter University male football players. The study was made an attempt has been to evaluate twenty one anthropometric measurements on inter college and inter University football players. A ratio of subjects was, 85 inter college level football players and 80 inter University level football players in this research. Results shows statistically significant differences \(P< 0.05\) in body weight \((t=2.14)\), lower extremity height \((t=2.54)\), and highly significant difference \(P<0.01\) in femur biepicondylar diameter \((t=3.71)\) between medalist of inter college and inter University football players and significant differences \(P<0.05\) in body weight \((t=2.62)\), BMI \((t=2.21)\), chest circumference \((t=2.76)\), hip circumference \((t=2.70)\), and highly significant difference \(P<0.01\) in thigh circumference \((t=3.79)\), femur biepicondylar diameter \((t=3.88)\).

Bisht, Dhapola and Dey (2008)\(^\text{18}\) purposed of this study was to compare the Body Composition, Physical and Physiological characteristics of


Hockey players at different field position. A total of thirty participants were selected from MPSWHA (Madhya Pradesh State Women's Hockey Academy) as subjects. Out of thirty subjects were divided into ten half, ten full backs and ten forward players. The estimation of Body Composition, Physical and Physiological characteristics were measured by various related reliable instrument. F -ratio with ANOVA table was used to examine the statistical comparison between different field positions. The study revealed that there was no significant difference in Body Composition, Physical and Physiological characteristics at different field position in Hockey.

Prasad, Yadav and Sajwan (2008)\textsuperscript{19} compared the study on Motor Fitness Components among Different Match Practice Groups. Motor Fitness is most often used synonymously with the physical fitness by the coaches but’ it is very important for the physical education students to understand the basic difference between physical fitness and motor fitness. Physical fitness is used to denote only the five basic fitness components (muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity and flexibility), whereas motor fitness is a more comprehensive term which include all the ten fitness components including additional five motor performance components (power, speed, agility, balance and reaction time), which are important mainly for success in sports. To compare the motor fitness components among different match practice group. The research scholar chose 50 male students of L.N.I.P.E., Gwalior and 10 students of each Match practice group. The performance of the subject in 50-yard dash, shuttle run, standing broad jump,

sit ups, 600m run/walk and pull-ups were taken as a criterion measure for the study. The study was delimited to the male students of different match practice group of L.N.I.P.E. The one-way analysis of variance (ANOVA) was applied to finding out the difference in various motor fitness components at 0.05 level of significance. Motor fitness comparison between different match practice groups i.e. Hockey, Basketball, Football, Volleyball and Track and Field which was not significant as calculated 'f' ratio 0.19 was less than tabulated 'f' ratio 2.57. With the limitation of the study it may be concluded that their was no significant difference between the different match practice groups i.e. Basketball, Hockey, Volleyball, Football an Track and Field in relation to their motor fitness when the subjects were involved in similar type of daily routine.

Saraswat and Sharma (2008) conducted a study to compare selected Physical and physiological variables of Indian male Basketball players at different levels of competition i.e. Inter State and Inter District respectively. The subjects for this study were selected from the Inter District and Inter State level Basketball players, randomly. The average age of the subject was 21.5 years ranging from 18 to 28 years. The Physical fitness components were measured using following test items - Speed-50 yard Dash (See), Strength-Grip Dynamometers (Kg), Power-Sergeant Jump (Cm), Endurance-2.4 (K.M.), (Min), and the physiological variables were measured using following test items. Resting pulse rate-Palpation of radial artery beats per Min, Peak flow rate-Peak Flow meter (Liters), Vital Capacity- Dry Spirometre (Liters). To determine

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the differences in selected physical and physiological variables of Basketball players at different level of participation (viz., inter district and Inter state) an independent ‘t’ test was used. The t-value found in relation to Physical variables i.e., Speed, Endurance, Power and Grip strength were 1.68*, 6.21*, 10.10* and 0.03 respectively. Results Reveals that Inter State Level players were significantly superior in speed, endurance and powers Variables as compared to the inter district players, but it was found that is no significant difference in Grip Strength variable of Inter district and Inter State level players. The t -value found in relation to Physiological variables i.e., Resting heart rate, Peak flow rate and Vital capacity were 0.51, 1.14 and 0.08 respectively. Results Reveals that there is no significant difference between the physiological parameters i.e. Resting heat rate, peak flow rate and vital capacity of Inter State and inter District Level players as the assumed ‘t’ value is lesser than the required ‘t’ value and at 0.05 level of significances. The physical & physiological parameters are contributing factors to the performance in Basket ball game. Therefore, much weight age is given to these factors in training of Basketball players. At higher stages / levels of competition the volume / intensity of training increases which might directly Improves the different physical fitness component of Basketball Players. Moreover, the total duration of training i.e. training age is higher for inter state level players to that of inter district players, which might be a factor for the improved physical variables among inter state level players while the grip strength doesn't plays much role in the improvement of Basketball playing ability of a player. If we closely look into the physiological foundation of Basketball, we might say that speed explosive strength, endurance and grip strength are directly linked with performance. However, resting heat rate, peak
flow rate and vital capacity will not have much weight age to cardiovascular endurance specific to Basket ball player as such these three components are not having much directly contribution to playing ability of basket ball player therefore for above stated reason significant differences in reference to physiological parameters were not found between inter state and inters district players.

**Lalit Mohan (2008)** conducted a study on An Investigation of Selected Motor Fitness and Skill Efficiency Variables of Volley Ball Players of Himachal Pradesh. The present investigation was conducted to assess the fitness and skill level of volleyball players of Himachal Pradesh. 374 volleyball players aged, 18 to 25 years were selected randomly from different colleges of Himachal Pradesh. To achieve the objectives of the study, AAHPER Youth Fitness Test Battery consisting of six test items- pull up (arm and shoulder strength), sit up (abdominal strength), standing broad jump (explosive power of legs), shuttle run (speed and agility), 50-yard dash (speed) and 600-yard run/ walk (endurance) was used to measure fitness level and Helmen Volleyball Skill Test consisting of three test items- face pass (set, pass and control the ball with the finger pads of both hands), fore arm pass (control the ball with the correct fore arm pass) and wall spike (hit the ball with power and accuracy) was used to measure skill efficiency level of volleyball players. The analysis of data shows that winner volleyball players are better in their fitness and skill efficiency components as compare to their loser counterparts.

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Ghai and Saraswat (2008). The present study was conducted to compare the pre competition temporal patterning of self confidence, somatic and cognitive anxiety among male athletes. 90 male athletes from three games (Football, Basketball and Volleyball) participated in All India Intervarsity Championship were selected as subjects for the study. The age of the students ranged from 18 to 24 years. The questionnaire used was consist of short form of CSAI-2 by (Cox, Russel and Robb) for measuring somatic and cognitive anxiety, while the self confidence was measured with 9 items of CSAI-2 by (Maretens, Vealey and Burton) corresponding to self confidence, the questionnaire were administered to subjects at different time durations prior to competition i.e. two weeks, one week, two days, one day, two hours and thirty minutes prior to competition. The statistical tool used for this study was one way analysis of variance (f-ratio). To find out the paired mean difference the LSD Post hoc test was used. The statistical findings pertaining to self confidence of Football, Basketball and Volleyball deteriorated gradually as the player approaches closer to the time of competition, the somatic anxiety of Basketball Players increased from a low level at two weeks prior to competition to a significantly high value just thirty minutes prior to competition. Similarly in the case of cognitive anxiety in all the three games gradually increased when the athlete approaches closer to the time of competition.

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Bhagirathi (2008). Relationship of Anxiety and Achievement Motivation to Goal Keeping among Secondary School Level Girl Hockey Players. The present investigation has been conducted with the aim to find out the relationship of Anxiety and Achievement motivation to goal keeping among Secondary School level girl hockey players. The study was conducted on ten girl hockey goalkeepers from different schools of Madhya Pradesh, India. Their age ranged between 14-19 years. The Sports Achievement motivation test standardized by Kamlesh and the State and Trait Anxiety inventory of Speilberger was selected for this study. To determine the relationship of anxiety and achievement motivation to goal keeping among girl hockey players, Pearson’s product moment method of correlation was used. The level of significance was set at 0.05 level in order to check the significance of calculated correlation. On the basis of findings of the study, significant relationship of state anxiety and trait anxiety to goalkeeping performance was observed for state (0.904) and trait anxiety (0.844) while no significant association with achievement motivation was found. Trait anxiety is negatively related to goalkeeping performance. State anxiety of inter school level goalkeeper has negative co-relation with their goalkeeping performance. Trait and state anxiety may negatively affect goal-keeping performance; The level of schoolgirl goalkeepers is of average level and therefore level of; achievement motivation has no relationship with their performance.

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Navaneethan and Thirumoorthi (2006) designed to examine the level of competitive state anxiety among south zone university basketball players. Two components of anxiety i.e., the level of cognitive anxiety, somatic anxiety and self-confidence were assessed between the genders. The samples include 50 male and 50 female basketball players between the ages of 18 to 25 years from various universities in South India. Anxiety was measured using the Competitive State Anxiety Inventory-2 (CSAI-2) by Martens et al. The results indicated that there was significant difference according to cognitive and somatic anxiety between male and female players. And also it revealed that there was no significant difference in self-confidence between the genders. Recommendations for future research were also discussed.

Svensson and Drost (2005), conducted the study of Testing soccer players they said “To cope with the physiological demands of soccer, players must be competent across several fitness components. The use of fitness tests in the laboratory and field assist in examining soccer players’ capabilities for performance both at the amateur and elite levels. Laboratory tests provide a useful indication of players’ general fitness. Accurate test results can be obtained with the use of a thorough methodology and reliable equipment. Laboratory tests are used sparingly during the season because of the time-consuming nature of the tests. Instead, tests are generally carried out at the start and end of the pre-season period to evaluate the effectiveness of specific training interventions. Field tests provide results that are specific to the sport

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and are therefore more valid than laboratory tests. The reduced cost, use of minimal equipment and the ease with which tests can be conducted make them more convenient for extensive use throughout the season. Although data from laboratory and field tests provide a good indication of general and soccer-specific fitness, individual test results cannot be used to predict performance in match-play conclusively because of the complex nature of performance in competition. Fitness tests in conjunction with physiological data should be used for monitoring changes in players' fitness and for guiding their training prescription.”

Wisloff et al. (2004),\textsuperscript{26} conducted the study to determine whether maximal strength correlates with sprint and vertical jump height in elite male soccer players. Seventeen international male soccer players (mean (SD) age 25.8 (2.9) years, height 177.3 (4.1) cm, weight 76.5 (7.6) kg, and maximal oxygen uptake 65.7 (4.3) ml/kg/min) were tested for maximal strength in half squats and sprinting ability (0-30 m and 10 m shuttle run sprint) and vertical jumping height. Result showed that there was a strong correlation between maximal strength in half squats and sprint performance and jumping height. They concluded that maximal strength in half squats determined the sprint performance and jumping height in high level soccer players and high squat strength did not imply reduced maximal oxygen consumption and also elite soccer players should focus on maximal strength training, with emphasis on maximal mobilisation of concentric movements, if they want to improve their sprinting and jumping performance.

Xiang, McBride (2004) examined students' motivation in an elementary physical education running program using achievement goal theory and an expectancy-value model of achievement choice as theoretical frameworks. Fourth graders (N = 119) completed questionnaires assessing their achievement goals, expectancy-related beliefs, subjective task values, and intention for future participation in running. They also completed a 1-mile run as a performance outcome. Results indicated that achievement goals, expectancy-related beliefs, and subjective task values were related to one another and were predictive of children's intention for future participation in running and their performance on the 1-mile run. Although boys and girls did not differ significantly in mean scores on the variables, they seemed to be motivated by a different combination of achievement goals, expectancy-related beliefs, and subjective task values. Findings provided empirical evidence supporting the use of multiple theoretical perspectives in motivation and achievement research in physical education.

Gorostiaga et al. (2004) conducted the study to determine the effects of simultaneous explosive strength and soccer training in young men. They selected 8 experimental (S) and 11 control (C) players, aged 17.2 (0.6) years, for testing before and after an II-week training period with respect to the load-vertical jumping curve [loads of 0-70 kg (counter-movement jump CMJO-70)], 5- and 15-m sprint performances, submaximal running endurance and basal serum concentrations of testosterone, free testosterone and cortisol. The

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results showed, in the S group, the II-week training resulted in significant increases in the low-force portion of the load-vertical jumping curve (5-14% in CMJO-30, P<0.01) and in resting serum total testosterone concentrations (7.5%, P<0.05), whereas no changes were observed in sprint running performance, blood lactate during sub-maximal running, resting serum cortisol and resting serum free testosterone concentrations. In the C group, no changes were observed during the experimental period. In the S group, the changes in CMJO correlated (P<0.05-0.01) with the changes in the 5-m (r=0.86) and 15-m (r=0.92) sprints, whereas the changes in CMJ40 correlated negatively with the changes in the testosterone: cortisol ratio (r=-0.84, -0.92, respectively, P<0.05).

The data indicate that young trained soccer players with low initial strength levels can increase explosive strength by adding low-frequency, low-intensity explosive-type strength training.

**Arnason et al. (2004)** studied on Physical Fitness, Injuries, and Team Performance in Soccer. To investigate the relationship between physical fitness and team success in soccer, and to test for differences in physical fitness between different player positions. Participants were 306 male soccer players from 17 teams in the two highest divisions in Iceland. Just before the start of the 1999 soccer season, the following variables were tested: height and weight, body composition, flexibility, leg extension power, jump height, and peak O\textsubscript{2} uptake. Injuries and player participation in matches and training were recorded through the 4-month competitive season. Team average physical fitness was compared with team success (final league standing) using

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a linear regression model. Physical fitness was also compared between players in different playing positions. A significant relationship was found between team average jump height (countermovement jump and standing jump) and team success ($P = 0.009$ and $P = 0.012$, respectively). The same trend was also found for leg extension power ($P = 0.097$), body composition (% body fat, $P = 0.07$), and the total number of injury days per team ($P = 0.09$). 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 $O_2$ uptake. However, only minor differences were observed between defenders, midfield players, and attackers. Coaches and medical support teams should pay more attention to jump and power training, as well as preventive measures and adequate rehabilitation of previous injuries to increase team success.

**Unierzyski (2003)**. Level of Achievement Motivation of Young Tennis Players and Their Future Progress. Psychological factors influencing tennis performance have long been recognized (Crespo, 2002). As American champion Jimmy Connors put it in 1981: “Tennis is 90% mental” (Weinberg, 1988). Psychological issues with respect to tennis have also been addressed in a large number of scientific studies which have examined many of the mental characteristics during competition. In order to test ‘achievement motivation’ a group of boys was made up of players aged between 11 and 14 years (n=185), taking part in tournaments organized by the Polish Tennis Association. On the basis of tournament results in players were placed by the Association into

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national rankings for the under 12 and under 14 age groups in the years 1990-1994. This process allowed us to investigate the relation between tennis performance and ‘achievement motivation’. In order to measure achievement motivation a questionnaire constructed by Widerszal-Bazyl (1978) was used. This consisted of 20 questions concerning ‘aspiration level’, ‘conformity’, ‘ability to postpone gratification’, ‘self believe’, ‘time perspective’, ‘Zeigarnik effect’ and ‘mental endurance’. In order to examine the influence of achievement motivation on tennis performance the players were divided into two groups: - Group A (n = 11), players who eventually reached international level (in the top 800 on WTA/ATP professional rankings) at the age of 18-20, i.e. 6 to 10 years after the questionnaire was completed - Group B (n = 174), players who never reached international level. The results of a Student’s t-test showed that the players who later reached international level in tennis (Group A, 73.3±3.8) possessed significantly higher (p < .01) level of achievement motivation than the players who never reached international level (Group B, 66.1±4.6). The results indicated that players from Group A generally possessed very high level of achievement motivation. It suggests that the high level of achievement motivation supported sport development of players from Group A and was one of the reasons of their progress. Achievement motivation is an essential element of human personality. It directs a person’s activity and makes it more (or less) dynamic. Without the desire to succeed other psychological features and abilities do not provide nearly so much influence on performance. Achievement motivation influences other factors affecting performance in sport like: physical preparation, technique, tactics and even life style (Gracz and Sankowski, 1995). This property, the "driving power of activity", should be understood as the joint function of the motive
power (which is a permanent property of personality) and the consequences of what a given individual expects of his own actions (Atkinson and Feather, 1966). This action is a product of two tendencies: 1) to achieve a success and 2) to avoid a failure. People with greater achievement motivation prefer tasks and situations where they can influence the result and their actions are successful (Gracz and Sankowski, 1995). Such people continue longlasting insoluble tasks more effectively and reveal greater persistence (Atkinson and Feather, 1966). Situations similar to this are dominant in sports performance. They occur e.g. even at the matches during a Davis Cup Tie, where players feel great responsibility and emotion about the result. Thus those tennis players who attain international status may be characterised by high levels of achievement motivation. These observations were confirmed in research on tennis players conducted by Butt and Cox (1992). The results indicated a higher level of achievement motivation among top class tennis players in relation to university players in the USA. Similar relationships were described by Schönborn (1984). On the other hand, the so-called negative motivation is characteristic of people with low achievement motivation, who are not confident and want to avoid a failure. In a match situation it usually evokes excessive stimulation and lowers the quality of sports performance. In the long term this often leads to a lack of progress or even giving up practising. High achievement motivation often manifests in an optimum level of stimulation in difficult situations and in realistic levels of aspiration (Czajkowski, 1995). The analysis indicates that achievement motivation can be identified as one property which determines the progress of young players with serious aspirations to play at international level. The influence of psychological aspects on tennis performance increases with age (Schönborn,
1993). It was also widely reported (Schönborn, 1993; Crespo and Miley 1998) that after the age of 15-16 years mental ability becomes one of the most important factors influencing tennis performance. Therefore achievement motivation should be added to the other important components which influence tennis performance and coaches should consider measuring the level of this achievement motivation during talent identification. This study as shown: 1) Junior players who eventually reached international level in tennis 8 to 10 years after the test questionnaire possessed significantly higher levels of achievement motivation compared with those who did not reach international level; 2) The results provided evidence that high achievement motivation is an important factor influencing tennis performance and 3) In the talent identification process it is important to measure achievement motivation at the early stages of a tennis career because it would strongly determine future performance.

**Edwards, Macfadyen and Clark (2003)** investigated whether a single soccer specific fitness test (SSFT) could differentiate between highly trained and recreationally active soccer players in selected test performance indicators. Thirteen Academy Scholars (AS) from a professional soccer club and 10 Recreational Players (RP) agreed to participate in this study. Test 1 VO2 max was estimated from a progressive shuttle run test to exhaustion. Test 2 The SSFT was controlled by an automated procedure and alternated between walking, sprinting, jogging and cruise running speeds. Three activity blocks (1A, 2A and 3A) were separated by 3 min rest periods in which blood

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lactate samples were drawn. The 3 blocks of activity (Part A) were followed by 10 min of exercise at speeds alternating between jogging and cruise running (Part B). Results showed that the estimated VO(2) max did not significantly differ between groups, although a trend for a higher aerobic capacity was evident in AS (p<0.09). And also exercising heart rates did not differ between AS and RP, however, recovery heart rates taken from the 3 min rest periods were significantly lower in AS compared with RP following blocks 1A (124.65 b x min(-1) +/-7.73 and 133.98 b x min(-1) +/-6.63), (p<0.05) and 3A (129.91 b x min(-1) +/-10.21 and 138.85 b x min (-1) +/-8.70), (p<0.01). They concluded that highly trained soccer players are able to sustain, and more quickly recover from, high intensity intermittent exercise.

**Chauhan (2003)** conducted the relationship between anthropometric variables and middle distance running performance. 56 middle distance runners which having 2 to 4 years running experience were selected as subject. There are 32 anthropometric measurements i.e., 13 linear measurements, 8 girths, 4 diameters and 7 skinfolds measurements within the age group of 18 to 30 years. An anthropometric variables such as anthropometer, vernier Caliper and Lange’s skinfold caliper and body composition variables such as body density, lean body mass (LBM), fat weight and fat percent were utilized and calculated by using equations respectively. Substantial correlations were obtained between the anthropometric variable and middle distance running performance are presented. The multiple correlation of the selected anthropometric variables collectively (i.e., height, 

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thigh girth, biacromial diameter and thigh skinfold) with running performance is significant but the size of the multiple correlation is not sufficient, so it cannot be used in the prediction equation of the middle distance running performance.

Young, James and Motogomery (2002)\(^3\) made a study to identify the relationships between leg muscle power and sprinting speed with changes of direction. The study was designed to describe relationships between physical qualities and a component of sports performance. Testing was conducted in an indoor sports hall and a biomechanics laboratory. 15 male participants were required to be free of injury and have recent experience competing in sports involving sprints with changes of direction. Subjects were timed in 8 m sprints in a straight line and with various changes of direction. They were also tested for bilateral and unilateral leg extensor muscle concentric power output by an isokinetic squat and reactive strength by a drop jump. The correlations between concentric power and straight sprinting speed were non-significant whereas the relationships between reactive strength and straight speed were statistically significant. Correlations between muscle power and speed while changing direction were generally low and non-significant for concentric leg power with some moderate and significant (p<0.05) coefficients found for reactive strength. The participants who turned faster to one side tended to have reactive strength dominance in the leg responsible for the push-off action. The relationships between leg muscle power and change-of-direction speed were not consistent. Reactive strength as measured by the drop jump

appears to have some importance for lateral change-of-direction speed, possibly because of similar push-off actions. It was concluded that reactive strength of the leg extensor muscles has some importance in change-of-direction performance but the other technical and perceptual factors than influence agility performance should also be considered.

Madialagan (2002) conducted a study on comparison of selected physical physiological and anthropometrical variables among swimmers and non swimmers of Karnataka State. Anthropometrics variables were selected as height, body weight, shoulder width, arm span, the study was conducted on 50 swimmers 50 non swimmers involved in other sports and 50 non sports persons in the age group of 7-8, 9-10, 11-12 and 14-15 years, girls from Karnataka state were selected as the subjects for the study.

Schilling (2001). Achievment Motivation among High School Basketball and Cross-Country Athletes: A Personal Investment Perspective. Goal perspective research in the sport setting has primarily focused on task and ego goal orientations, while failing to address the influence of social goals (e.g., Urdan & Maehr, 1995). Maehr and Braskamp’s (1986) personal investment theory allows researchers to examine achievement motivation from a multidimensional perspective that incorporates social factors of motivation. Thus, the purpose of this study was to examine the nature of the personal incentives, sense of self, and perceived options (Maehr & Braskamp, 1986) of basketball and cross-country athletes via semi-structured interviews. Results

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34 S. Madialagan, “Comparison of Selected Physical Physiological and Anthropometrical Variables Among Swimmers and Non-Swimmers of Karnataka State” (Unpublished Ph.D. Thesis, Bangalore University, Bangalore 2002).

from content analyses revealed that athletes defined positive and negative experiences through task-, ego-, and socially-oriented personal incentives as well as sense of self and perceived options components. Socially-oriented personal incentives and sense of self components were more prevalent for the basketball athletes than for the cross-country athletes. Notable sport group differences suggest the need to further examine social factors of motivation with a broader representation of individual and team sport athletes.

**Dunn and Dunn (2001)** Relationships Among the Sport Competition Anxiety Test, the Sport Anxiety Scale, and the Collegiate Hockey Worry Scale. This study was examined the degree to which the Sport Competition Anxiety Test (SCAT; Martens, 1977) and the Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990) shared variance with the four subscales of the Collegiate Hockey Worry Scale (CHWS; Dunn, 1999)—a sport-specific measure of athletes’ dispositional tendencies to worry about performance failure, negative social evaluation, physical danger, and situational uncertainty. Participants were 178 male intercollegiate ice hockey players. Correlation and regression analyses reinforced the links between worries about failure and negative social evaluation to competitive trait anxiety (CTA). However, neither the SCAT nor the SAS shared more than 5.8% of the variance surrounding athletes’ worries pertaining to physical danger and situational uncertainty. Findings are discussed in the context of Martens, Vealey, and Burtons’ (1990) recommendation to develop instruments with separate subscales measuring different situational components of CTA.

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Reddy, Reddy and Samiullah (2000)\(^{37}\) made a study on the impact of level of participation on psychological factors such as aggressions, Anxiety, Achievement motivation and performance. 625 soccer players representing three different levels i.e., inter university, inter-district, inter-collegiate constituted the sample of the study. Sports competition Anxiety Test (SCAT) marten (1977) aggressiveness Questionnaire (AQ) Smith (1973), Sport achievement Motivation Test (SAMT) Kamalesh (1983) was administered to assess anxiety. Aggression, Achievement Motivation and performance only. Aggression and achievement motivation is found to have negative impact on the performance.

Om Prakash (2000)\(^{38}\) assessed the relationship between the factors influencing the sports career and psychological variable such as anxiety (cognitive and somatic), self-confidence, adjustment and achievement in state level sportmen. The sample of the study consists of 72 male players selected for this study on random basis. To collect the required data the inventory of factors influencing sports career (IFISC) of Kamlesh and Sharma (1990) Revised adjustment inventory (RAI) of P. Kumar (1983) and Sports Achievement Motivation Inventory. M.L. Kamalesh (1990) was administered to measure the internal control factors and external factors. External control factor having significant positive relationship to self confidence in state level as an external control factor having significant positive relationship to cognitive anxiety, negative relationship of self confidence and also having

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\(^{38}\) Om Prakash “Relationship Between Factors Influencing Sports Career and Anxiety, Self-Confidence Adjustment and Achievement Motivation”, Souvenir XIII National Conference on Sports Psychology (2000), P.34

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negative relation to adjustment. External control factors (total) influencing the
sports career having positive significant relationship to adjustment in state
level sportsmen.

Prakash, Kumar and Munreddy (1999)\(^9\) conducted a study, which
aimed to identify difference, if any, between achievement motivation and
selected personality traits of university volleyball and cricket players. For this
purpose Mangalore university volleyball (n=15) and cricket (n=16) players, who
were attending final coaching camp at university campus before the inter-
university competitions well chosen. Both the teams had creditable
performance record. Essence personality Inventory (EPI) and Kamlesh’s Sports
Achievement Motivation Test (SAMT) were administered to the subjects. The
element of sports specific personality characteristics were not observed with
the university players considered for the study. Data analysis shows no
significant difference between personality characteristics and achievement
motivation of university players participating in different sports activities.
The following conclusions were drawn from the study, University level sports-
persons did not differ much in relation to personality traits and achievement
motivation. Sports achievement motivation should be viewed as a separate
concept instead of viewing with one’s personality.

Reddy, Rao and Singh (1999),\(^{40}\) recognized the importance of
psychological training for competitions. The emphasis is on the development
of psychological skills, such as building confidence. It appears that the more

\(^9\) S.M Prakash, C.K Kishore Kumar, and R. Munreddy, “Achievement Motivation
and Personality a Comparative Analysis of University Volleyball and Cricket Players”,

\(^{40}\) Madhusudhan Reddy, V.V.B.N. Rao and Rajendra Singh, “Analysis of Self
Confidence, and Achievement Motivation between Medallist and Non-Medallist”
competitive the individual, the more self-confident he/she will be in a competitive situation. One personality dimension that is widely regarded as a prominent feature of human behavior achievement motivation, which is recognized as a capacity to experience pride in accomplishment or as a disposition to strive for success across varied achievement situations and standards (McClelland, Atkinson Clark and Lowell, 1958). Dick Anrenla, one of the most successful high school swimming coaches in the US stated that motivation largely depends on goal setting. The higher the goal, the higher the performance. A study was conducted on a total sample of forty subjects drawn from the A.P. Seriromt level boxing championship, held at Warangal from 1st to 3rd Oct 1999. The subjects were selected at random and divided into two groups. Medalist and non-medalists. For the purpose of data collection Robin’ as self-confidence and Kenlist’s Motivation questionnaire were administered to evaluate those psychological factors.

Nageswaran (1999). The study to find out whether there is any relationship between the selected skill performance and the combined effect of a Anxiety, Aggression, Achievement motivation and self concept of university basketball players. To achieve this purpose forty men basketball Players were selected as subjects from different universities who participated in the south zone inter university basketball tournament held at Gandhigram University. For this study, dribbling passing shooting was selected as criterion variables and aggression anxiety; achievement, motivation and self-concept were selected as independent variables. The multiple correlations were used to

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find out the relationship between the elected skill performance and the combined effect of anxiety, aggression, achievement motivation and self-concept for each criterion variable separately. The results showed the significant relationship between the selected skill performance (Dribbling, passing, shooting) and the combined effect of anxiety, aggression achievement motivation and self-concept of university basketball players.

Shaw (1999)\(^2\) compares among the selected level of sports achievement namely zonal, inter zonal/state, national and non-participation on SAMT (Sports achievement motivation Test) scores of schoolboys and girls independently; to compare among the selected levels of sports achievement namely inter-collegiate/state, national/inter-university/ inter-national and non-participation on SAMT score of college boys and college girls independently and to compare among the selected levels of sports achievement on SAMT scores of schoolboys, college boys school girls and college girl’s independently. The study was conducted on 68 males and 14 males from selected school and 56 male and 51 females from selected colleges were randomly sample with age ranging from 11-20 years at school level and 17-26 years at college level sport achievement motivation Test (SAMT) developed by Dr. M.L. Kamalesh, was administered on the selected subjects as per instructions to obtain SAMT scores. The findings and the study indicates that significant sex differences were observed on SAMT scores between: School boys and girls at national/international level; College boys and girls at inter zonal/state level at 0.05 level of significance.

A person who is physical fit possessed the strength and stamina to carry out his daily tasks without undue fatigue and still have enough energy to enjoy leisure and to meet unforeseen emergency, fitness improve general health and is essential for full vigorous living of the physically fit child, who fuels alert and eager to do things.

Reddy, Rao and Mohan (1998) believed that vast majority of elite athletes recognized the importance of psychological training for competition. The latest emphasis on the development of psychological skills, such as building confidence. One personality dimension that is widely regarded as a permanent feature of human behavior is achievement motivation. For the purpose of collection of data the investigators have selected the psychological factors self confidence and achievement motivation. Yearly robins and Kamalesh’s respectively. The questionnaire was administered on senior national volleyball men and women players 97 held at visage basing on the mean and 't' value statistical technique was used for comparison of groups. On analysis of data, it was found that confidence levels and motivation levels of men and women players are not equal. The differ in their psychological factors.

Lakmeesha (1998) conducted a study non motor development of Indian male children and youth from 9 to 16 years of age [N=276] subjects were taken from different states of India and the following tests were

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43 Reema Kistani, “Physical Fitness” (Delhi: Khel Sahitya, 1998), P.1.
45 Y.S. Lakmeesha. Variation in Physical and Physiological Variables among the Boys of 12-16 years belonging to Different Graphical Conditions of Karnataka, (Unpublished Doctororal Thesis Bangalore University, 1998.)
conducted to assess the motor development 40mts dash, forward bend and reach, standing broad jump, zigzag run, 8kgs shot put, 800mts run and 1500mts run apart from these the height and weight were also taken. The data was statistically analyses age wise the result showed significant improvement in physical growth and motor development different phases of growth and development of Indian children and youth.

Gowda (1998) carried out the comparative study selected physical fitness variables among kabaddi players based on position out play 120 kabaddi players were selected as subject from the Mysore University intercollegiate tournaments. The subject was divided in three equal groups of 40 each, under offensive, defensive and all rounder categories. The physical fitness variables will be selected for this study; were strength; speed, endurance agility, power and muscular endurance. The following test administered to obtain the data: Hexed Arm, shuttle run, standing broad jump, 50 yard dash, chin ups, half squat jump, and push ups. The results, related that there were no significant differences among offensive and defensive and all round groups in any of the physical fitness variables.

Lavallee and Flint (1996) The Relationship of Stress, Competitive Anxiety, Mood State, and Social Support to Athletic Injury. They examined the role of stress, competitive anxiety, mood state, and social support in athletic injury. Specifically, They hypothesized that athletes reporting high levels of stress, high competitive trait anxiety, negative mood state, and low social

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support would exhibit greater incidence of injury and injury severity. Design and Setting: Correlational analysis. Major Canadian university. Subjects: Voluntary sample, 55 male varsity athletes (42 football, 81% of the football team, and 13 rugby, 74% of the rugby team), ages 19-28 yr (x = 22). Measurements: The inventories Sport Competition Anxiety Test (SCAT), Social Support Scale, Social Athletic Readjustment Rating Scale (SARRS), and Profile of Mood States (POMS) were administered. Internal consistency of the selfreport measures was tested using Cronbach’s alpha coefficient. Injury rate and severity were recorded by the head student therapist throughout the season. Results: Correlational analyses performed using Pearson correlational coefficient revealed that competitive anxiety (r = .29, p = .03) and tension/anxiety mood states (r = .43, p = .001) were related to injury frequency, and that tension/anxiety (r = .44, p = .008), anger/hostility (r = .30, p = .02), and total negative mood state (r = .28, p = .038) were related to injury severity. Individually, the two sports yielded somewhat different results: for football, injury frequency and injury severity were related to tension/anxiety (r = .43, p = .004 and r = .47, p = .002, respectively). Vigor/activity was found to be significantly related to injury rate (p = .02), but since the internal consistency of vigor/activity was less than .70 on the Cronbach alpha scale, this significant finding was disregarded. In rugby, injury frequency was related to tension/anxiety (r = .58, p = .04) and depression/dejection (r = .57, p = .04). Conclusions: These findings are useful for athletic trainers in identifying athletes who may possess psychological factors predisposing them to athletic injury. Subsequently, athletic trainers can instruct these athletes or refer them for assistance in psychological preventive interventions. These findings add information to a growing body of literature that points to the contribution of
psychological factors in the incidence of athletic injuries sustained in university sport. Thus, a new dimension can be added to the Andersen and Williams’ model. Andersen and Williams’ emphasize that information gained from research into the stress-injury response should not be used to label athletes as "injury-prone." Rather, as found by Davis,5 the findings should serve to allow identification of high-risk athletes who may be aided by psychological intervention such as mental imagery and relaxation techniques.

It is very difficult to conduct a study including all possible variables that may influence rate and severity of injury. All research performed in the realm of the stress-injury response contributes to the Andersen and Williams’ model. Although many causal factors have been suggested, further research in the stress-injury relationship is needed to support past findings, identify new determinants, and identify psychological intervention techniques.

Dean (1996)48 structured a theoretical framework of achievement motivation for participants in the field of athletics. An experiment he conducted using male students performing on a stabilometer produced on relationship between grades and ability to perform motor task. There was no relationship between college entrance scores and performance either when Ryan there was no difference between the athlete and no athlete.

Basavaraju (1995)49 selected 20 Kho-Kho players and 20 football players from Club members and Bangalore University players. The subjects were in the age group 18-25 years. The AAPHER youth fitness test was used to find their “physical fitness element, five components were measured such as,


Pull-Ups, standing broad jump, 50 meters run, 800 meters run and flexibility (flexometter). The data collected were compared with the percentile norms for college men given by AAHPER to find the relative dominance of various factors in different ‘groups. He concluded the football players have scored significantly higher than in the Kho-Kho players in power, strength, speed and endurance and Kho-Kho players were significantly higher than the football players in Flexibility. Michael has found that there was a significant positive relationship between physical ‘fitness and football and Basketball skill.

Singh et al. (1994)\textsuperscript{50} conducted a comparative study of ability of attacker and set-upper in volleyball. The 44 male volleyball players (33 attackers, 22 set-uppers) of university and state levels were taken as subjects. Ten motor ability tests, along with age, body weight and standing reach were taken separately for the two groups, attackers and set-uppers. The mean, standard deviation and ‘t’-test were used as statistical tool. It was found that attackers are significantly younger, heavier and taller than set-uppers. The attackers and set-upper do not differ significantly in test except basketball throw. But attackers are better in 40 mt. sprint, standing vertical jumps, 9-3, 6-3-9 meter agility and 2.4 km. run. Set-uppers are better in block jump, forward bend reach and bend knee sit-ups.

Sedlock et al. (1994)\textsuperscript{51} examined the effect of trait anxiety (TA) and cardiovascular fitness level on physiological and psychological responses


during a resting baseline period, a 15-min exercise period, a 20-min recovery period, a 5-min mental arithmetic task, and a 10-min recovery period. Groups based on their TA and estimated maximal oxygen uptake: HI TA/HI FIT (14 Ss), HI TA/LOW FIT (20 Ss), LOW TA/HI FIT (10 Ss), and LOW TA/LOW FIT (14 Ss). Heart rate (HR) and state anxiety were assessed throughout the experiment. HI TA Ss had a higher HR during Min 9-20 of the post stressor period and higher state anxiety across conditions than LOW TA Ss. HI TA/LOW FIT Ss tended to have higher HR during Min 1-2 of the post stressor period than LOW TA/LOW FIT Ss. Findings suggest that fitness level does not mediate the influence of TA on stress responses.

Goudas, Biddle and Fox (1994) examined the relationship between dispositional achievement goal orientations and intrinsic motivation following physical fitness testing. Students, aged 11-15 years, completed the Task and Ego Orientation in Sport Questionnaire, participated in the 20-m progressive shuttle run test, and then completed a modified Intrinsic Motivation Inventory (IMI). Using their goal orientations, students were placed into one of four groups: low in both task and ego, high ego/low task, high task/low ego, and high in both task and ego. A MANOVA indicated that for students in the "high" and "low" performance groups, differences in intrinsic motivation between goal orientation groups were found. Perceived success and goal orientations had independent effects on intrinsic motivation for the lower performance group but interacted to influence intrinsic motivation for the higher performance group. It is concluded that children have different motivational

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reactions to fitness testing, depending on their goal profile, performance, and perceived success.

**Bangsbo (1994)** study deals with the physiological demands of soccer, with a particular focus on the physiological response to repeated intense exercise. Measurements have been performed during soccer matches and training, as well as in experiments simulating the activities of a soccer match. The information obtained has been compared to results from studies of the physical capacity of top-class soccer players and from laboratory experiments aimed at investigating metabolism and fatigue in intermittent exercise. Analysis of activities during soccer matches showed that a top-class soccer player covers an average distance of approximately 11 km during a match. The distance differs highly between players and is partly related to the position in a team. Midfield players run more at low speed than defenders and forwards, whereas no difference appears to exist between groups when comparing the distance covered at high speed. The distance covered at high speed is the same in the beginning as in the end of a match. The total distance covered by a player during a soccer match is only to a limited extent a measure of the physiological demands on the player during the match. In addition to running, a player is engaged in many other energy demanding activities, i.e. tackling, jumping, accelerating and turning. A more precise evaluation of the total energy demand during a soccer match may be achieved by performing physiological measurements in connection with soccer matches.

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Singh and Singh (1993)\textsuperscript{54} studied on Cardiopulmonary capacities of twelve adults (Aged between 14 to 44 Years) with varying digress. Of blindness engaged in regular recreational activities were compared with twelve age matched normal sighted healthy males (Control Group) who were also involved in regular recreational activities 1 maximum oxygen consumption (vo2 Max) was measured directly during exhaustive exercise test in a cycle ergometer. Forced vital capacity, leg strength and power were determined by spirometry, standing long jump and vertical jump respectively, No significant differences in VO2 max, forced vital capacity and leg strength and power were determined by spirometry, standing long jump and vertical jump respectively. No significant differences in Vo2 max, forced vital capacity and leg strength and power were observed between the blind and the control groups. No anthropometric differences were evident between the two groups. The results show therefore that the visually handicapped who are active can have a similar level of physical Fitness long function and explosive leg strength as those of their active signed counterparts.

Dey, Khanna, and Batra (1993)\textsuperscript{55} investigated on morphological and physiological studies on Indian national kabaddi players. Twenty-five national kabaddi players (Asiad gold medalists 1990), mean age 27.91 years, who attended a national camp at the Sports Authority of India, Bangalore before the Beijing Asian Games in 1990, were investigated for their physical characteristics, body fat, lean body mass (LBM) and somatotype. The


physiological characteristics assessed included back strength, maximum oxygen uptake capacity and anaerobic capacity (oxygen debt) and related cardio respiratory parameters (oxygen pulse, breathing equivalent, maximum pulmonary ventilation, maximum heart rate). Body fat was calculated from skinfold thicknesses taken at four different sites, using Harpenden skinfold calipers. An exercise test (graded protocol) was performed on a bicycle ergometer (ER-900) using a computerized EOS Sprint (Jaeger, West Germany). The mean (S.D.) percentage body fat (17.56(3.48)) of kabaddi players was found to be higher than normal sedentary people. Their physique was found to be endomorphic mesomorph (3.8-5.2-1.7). Mean (s.d.) back strength, maximum oxygen uptake capacity (VO2max) and oxygen debt were found to be 162.6(18.08) kg, 42.6(4.91) ml kg⁻¹ min⁻¹ and 5.02(1.29) litre respectively. Physical characteristics, percentage body fat, somatotype, maximum oxygen uptake capacity and anaerobic capacity (oxygen debt) and other cardiorespiratory parameters were compared with other national counterparts. Present data are comparable with data for judo, wrestling and weightlifting. Since no such study has been conducted on international counterparts, these data could not be compared. These data may act as a guideline in the selection of future kabaddi players and to attain the physiological status comparable to the present gold medalists.

Bujarke, Halyal and Singh (1991) conducted a study on relationship of achievement motivation and attribution to performance outcome in competitive athletics. The concepts on achievement motivation and attribution

are well known in the field of sports psychology. The present study makes an attempt to investigate the relationship of achievement motivation and attribution to the performance on some athletic events. The data for the study were collected on 50 men athletics who participated in all India inter university athletic meet. Questionnaires pertaining in all India inter university athletic meet. Questionnaires pertaining to the main two psychology concepts are used for the purpose. The investigation highlights the achievement motivation is a contributory factor for the performance in events like 10 mts and 800 mts run.

Bandyopadhy (1990)\textsuperscript{57} studied the physical and physiological profiles of 20 female Indian classical dancers and 20 female physical educators of average age of 22 years. The physical and physiological variables chosen for the study were cardio-endurance; agility, flexibility, resting heart rate; resting systolic and diastolic blood pressure, vital capacity, body composition and hemoglobin concentration. The response of classical dancers and physical educators to the selected variables in terms of recorded scores were analyzed by one way ANOVA and it was found that Indian Classical Dancer's Group had significantly superior ankle flexibility, while the physical educators group had significantly lower diastolic blood pressure and percentage of body fat, higher lean body mass and abdominal strength endurance. In the variables of cardio-respiratory endurance, vital capacity, resting heart rate, resting systolic blood pressure, hemoglobin concentration, agility, flexibility of high and back, trunk

\textsuperscript{57} Sagarika Bandyopadhyay, “Comparison of Selected Physical and Physiological Profiles of Indian Classical Dancers and Physical Educators” (Unpublished M.Phil. Dissertation, Jiwaji University, Gwalior, 1990).
and neck as well as shoulder and wrist, both the group showed no significant
difference.

**Sukkasem and Vijit (1989)** conducted a study to measure and compare height, weight, weight residual, skinfolds thickness, % of body fat, 11 body circumferences, strength, flexibility, reaction time and the resting electrocardiogram of 80 Oklahoma state university male students between 20-31 years of age from middle east, east and south east Asian countries who were selected by stratified random sampling. The results were compared with the United States population norms. A comparison was also made among the foreign students who had been in the United States less than one year and more than 3 years. Multiple t-tests were used to determine if any differences existed between the groups in the selected physical fitness variables at the 0.05 confidence level. The result of the above study showed that the United states had a significantly higher mean value of height than the middle east students and also had significantly higher than mean values of height and weight than the east and south east Asian students. The middle east had a significantly higher mean value of the sum of the six sites of skinfolds thickness than east and south east Asian students. The middle east has a significantly higher mean value of the body circumference of shoulder, chest, buttock, thigh, forearm and ankle than those of the east and south east Asian students. The middle east had a significantly higher mean value of the circumferences of shoulder, biceps, wrist and ankle than the united states. The east and south East Asia had significantly higher mean values of shoulder

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circumference than the United States. The United States had significantly higher mean values of the circumference of the shoulder, chest, abdomen, buttock, forearm, thigh, knee and calf than South East Asia. The United States had significantly higher mean values of left and right arm grip strength than the Middle East and South East Asia.

**Ramasekar (1989)** undertook a comparative study to compare the leg explosive power of the Soccer and Kabaddi players at the college level. The result of this study indicated that the soccer players had better leg explosive power than Kabaddi players at college level.

**Amusa (1989)** studied the relationship between skinfolds measures percent body fat and total plasma cholesterol in university athletes. Twenty healthy male and ten female athletes from Lagos state university (LASU) were selected randomly from the population of athletes that represented LASU at the Nigerian universities games association (NUGA). Height was measured in cms on a stadiometer. Skinfold (SF) thickness was measured at five sites for male and six sites for female. Percent body fat (% fat) was calculated by using Brozek, et. al. (1963), equation. Plasma cholesterol was determined immediately after using enzymatic colorimetric (Ames) method. The relationships of total plasma cholesterol, % fat and anthropometric measures were studied by calculating Pearson coefficients of correlation. The result of the study showed there was a significant difference in % body fat and measurement but there was no significant differences cholesterol.

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Gowda (1989)\textsuperscript{61} carried out the comparative study of selected physical fitness variables among Kabaddi players based on positional play. 120 Kabaddi players were selected as subjects from the Mysore University intercollegiate tournaments. These subjects were divided into three equal groups of forty each, under offensive, defensive and allround categories. The physical fitness variables will be selected for this study were strength, speed, endurance, agility, power and muscular endurance. The following test were administered to obtain the data (1) flexed arm hang (2) sit-ups (3) shuttle-run (4) standing broad jump (5) 50 yard dash (6) Burpee test (7) chin-ups (8) half squat jump test (9) push ups. The results revealed that there were no significant difference among offensive and defensive and allround groups in any of the physical fitness variables.

Berger and Paradis (1989)\textsuperscript{62} conducted the AAHPER Physical Fitness Test in 115 boys of Junior High School, to compare the physical fitness scores of white and black seventh grade boys of similar socio-economical level. Two racial groups were formed consisting of 30 white and 30 black students who were matched as age and socio-economic level. The means of height and weight of white students was a little greater than that of students. There was no significant difference between the groups in age, height, weight and socio-economical level. The results showed that the black students exceeds the white students significantly on the shuttle run, 50 yards dash, 600 yards run composite fitness score. It was concluded that black male students of similar


socio-economical level to white students in the seventh grade have a higher level of physical fitness.

**Varghese (1988)**
Athletes participate in competitive sport for various reasons. The study aims to find out if the university athletes can be distinguished from the veteran athletes as well as if male and female athletes differ in their motivation factors. The sample consisted of track and field Athletes of the 54. All India inter university athletic meet held at Kottayam And the XVth national veteran athletic championship help at Trivandrum. The tools administered were the incentive motivation. Inventory and the sport achievement motivation test results indicate that the major Motivating forces for participation in sport by the university athletes are Independence and aggression while excellence and affiliation was the major factor for sport participation among female athletes and for the male athlete's power was their main factor. The variable sport achievement motivation showed no difference among the groups.

**Urs (1988)** conducted the study to investigate the personality profile and socio-economic background of university cricket and kho-kho players. Cettell16-PF (From B) was administered to cricket players (n=30) along with the socio-economic status scale of Kuppuswamy (urban) and Udai Parek (rural) to payers who have represented the Bangalore University in the all India inter university competition. Both the groups indicated similar personality profiles separate personality components revealed deviation from the normal

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population on two of the variables for both groups namely: Cricket players-auspicious (high); reserved (low) kho-kho players-outgoing (high); treating (low). The result also revealed that 20 out of 30 players in cricket are from the urban classes and all the 30 kho-kho players are from the rural lower class. It is concluded that the cricket players and kho-Kho players of this study will similar and quite average as normal in their personality profile with regard to the socio-economic background. The cricket players are from high socio-economic background and kho-kho players are from low socio-economic background. Male cricket (n=30) and kho-kho players (n=30) were chooses as subjects. Age of the sportsmen ranged from 17 to 24 years. The players representing Bangalore University in the AIIU championship were selected. The researcher administered from B of the 16 PF test along with information blanks of socio-economic status scale. During the conduct of the coaching camp. The scoring procedure used here concerns with the procedure given by the author using the entire personality profile simultaneously.

Singh and Gill (1988)\(^5\) conducted a study to examine the physical and physiological characteristics of Volleyball, Football players and cross country runners. Members of Punjab University Men’s Volleyball team (N=12), Football team (N = 16) and cross country runners (N=15) were taken as subjects. Age, weight and height were recorded, skinfold measurements were taken to calculate percent body fat and lean body weight. Under physiological variables vital capacity, maximum breath holding capacity, maximum expiratory pressure, heart rate, systolic and diastolic blood pressure were

taken and a dynamic cardio-pulmonary index was calculated. Results showed that Volleyball players were taller and heavier than Footballers and cross country runners and had higher cardio-pulmonary index.

Selvaraju (1988)\(^66\) conducted a study to compare the physical fitness between hockey and football players. The physical fitness tests comparison of fifty meters ran. Eight hundred meters run and leg strength using leg dyno meter were conducted on both hockey and football players. The collected data were subject to statistical analysis, which showed that there was no much significant differences between the two team of players.

Gill (1988)\(^67\) compared physical fitness and self concept of college students. Sixty (60) male students of certificate course of Physical Education College, Amaravati, were selected as subjects for this study. On the basis of their level of self-concept, the subject were divided into three groups namely ‘High Self Concept’, ‘Average Self Concept’ and ‘Low Self Concept’. On the basis of their self-concept scores the physical fitness of the subjects of these groups was measured by AAHPER Youth Fitness Battery. Composite score of physical fitness were computed by adding standard deviation scores (Z scores) corresponding to the raw score in each of the items of the test battery. The mean score in physical fitness of high average and low self concept groups were tested for significance of variance by ANOVA. As the obtained ‘F’ ratio was significant, the difference between the pair of group means was further tested for significance by applying Scheffe’s Post Hoc Test. They concluded


that the group with high self-concept distinctly differed from average and low self-concept groups having significantly higher mean physical fitness score. The group mean differences of physical fitness scores of average and low self-concept groups are not statistically significant.

**Mann (1988)** studied a sample of 44 male players (Football 16, Basketball 14, Volleyball 14) and administered Hamm's Scale of Competitive Anxiety to them. It was concluded that no significant differences exist in the level of competitive anxiety in all the situations among Football, Basketball and Volleyball teams. Football team varied significantly from other two teams, depicting higher level of competitive anxiety on anger mode of response.

**Toriola, Adeniran** and **Ogunremi (1987)**, comparatively assessed the body composition and anthropometric characteristics of elite male basketball (n=15) and volleyball (n=15) players and male non-athletes (n=20) at the University of Ife, Nigeria. The ages of the subjects ranged from 19 to 29 years. Analysis of variance and Newman-Keuls post hoc method were used to determine significant differences in the physical characteristics of the groups. The basketball players were significantly taller and had markedly larger humerus width than the volleyball and non-athletic groups (p< 0.05). The non-athletes had significantly higher percent body fat values than both the groups of athletes (p< 0.05). The basketball (4.30) and volleyball (4.40) players who were predominantly ectomesomorph had significantly higher ectomorphic component (P < 0.05) than the non-athletes (2.5). The differences

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observed between the athletic groups are related to the morphological factors, which influence the basic components of competitive sports performance.

Panigrahi (1987) conducted a study to compare the anthropometrics measurements of the spring swimmers and sprint runners. Forty subjects belong to different parts of India and belong to varying social economic status. The average age of the subjects was in years, ranging from 20 to 28 years. The following anthropometrics measurements of the subjects were taken as criterion measures were weight, standing height, sitting height, chest girth, arm length, upper arm girth, fore arm girth, thigh girth, leg length, calf girth all the measurements were made using standard procedures, the scores of sprint runners and print swimmers in each of the criterion variables were for significance of the mean difference by the test at 0.05 level of significance.

Dey (1987) made an attempt to find out whether at certain levels of achievement, sportsmen participating in different games and characterized by district anthropometric measurement, and to find out proportionate ratio of segmental and total body measurement required for a sportsman for a particular game. For this study, 12 from each sport i.e., swimming, basketball, handball and table tennis were selected from the top first four standing teams of National School Games. The result of the study have indicated that a) Basketball players have significantly higher height, arm length, leg length, thigh girth and weight than those of the handball, swimming and table tennis

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players. b) Handball players possess more height, leg length, thigh girth and weight as compared to swimmers and table tennis, c) Arm length, arm girth of swimmers are more as compared to handball and table tennis players, d) There was no significant difference between table tennis players and players of other games in the selected anthropometric measurements.

**Bucher (1987)**\(^{72}\) states that trained individual is in a better state of physical fitness than the person who follows a sedentary inactive life-when two persons are trained and one untrained of approximately the same build are performing the same amount of moderate muscular work evidence indicates that the trained individual has a lower oxygen consumption lower pulse rate longer stroke volume per heart beat less cell counts, slower rate of breathing, lower rate of blood pressure and heart rate. The heart becomes more efficient and is able to circulate more blood while breathing less frequency.

**Uppal and Roy (1986)**\(^{73}\) conducted a study on assessment of motor fitness compound or prediction of soccer playing ability. The 33 male soccer players attending coaching camp prior to inter-university students were taken as subjects. Five motor fitness compounds speed (50 mt. dash), agility (4x10 mt. shuttle run), maximum leg strength (leg dynamometer), explosive leg strength (standing broad jump) and cardio-respiratory endurance (Cooper’s 12 min. run/walk test) were administered on graded subjects out of 50 marks in playing ability by three judges: Result showed that independent variable (speed ML strength, EC strength and cardiovascular strength) were

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significantly related to dependent variable. Since the multiple correlation coefficient is higher than zero order correlation coefficients, therefore, further better performance in soccer all the independent component chosen must be considered.

Overton (1986) examined how the coping behaviors and achievement motivation of 181 athletes (aged 18-66) with cerebral palsy or other physical disabilities influence participation in the normalized activity of competitive sport. The project examined the following cognitive aspects of performance: (1) reasons for becoming involved in sports; (2) how the athletes define personal success or failure in sports; (3) how athletes explain winning and losing performances; (4) how athletes cope with disability; (5) how athletes cope with the stresses of competition; and (6) factors which influence an athlete's decision to persist in sport competition. Questionnaires were administered before and after the National Cerebral Palsy/Les Autre Games of 1985. Results indicated that the athletes were characterized as moderately high on coping with disability status and their achievement orientations were similar to those of a sample of non-disabled athletes. Both winners and losers used internal and external attributions to explain performance. Significant differences were noted between severely disabled and less severely disabled athletes in the use of attributions. The coping strategies of problem solving and positive reappraisal were used most often by the athletes. Much of the document consists of appendixes which include the study questionnaires and presentations given at professional meetings.

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Harvey (1986)\textsuperscript{75} used McClelands Thematic Apperception Test in the investigation of achievement motivation theory on athletes and non-athletes. He hypothesized that achievement motivation is an important component in the psychological make up the athlete when he found that athletes did not differ significantly on the need for achievement. His findings did not agree with the concept that high achievement need is related to high performance or that how achievement need is related to poor performance.

Dhaka (1986)\textsuperscript{76} conducted a study was to compare sportsmen participating in different events of track and field on the selected physical and physiological variables. For this purpose 60 male athletes, 20 each belonging to the categories of sprinters, jumpers and long distance runners from Delhi were selected as subjects due to non-availability throwers could not be considered. The speed, strength and flexibility were selected as the physical variables where as the blood hemoglobin content; blood pressure and pulse rate were selected as the physiological variables. The data on the selected physical and physiological variables were collected by administering the relevant standardized tests/procedure after establishing its reliability for comparing three groups of athletes analysis of variance was applied and to test significance of differences between the paired means Scheffe’s post hoc test was applied where F ratio was found significant.


\textsuperscript{76} Amita Dhaka, “Comparison of Selected Physical and Physiological Variables in Sportsmen Participating in Different Events of Track and Field”, (Unpublished Master Thesis, Jiwaji University, 1986).
studied the relationship between selected physical fitness variables with the playing ability of hockey players. The 22 women (16 to 22 year) hockey player were taken as subjects. Three judges rate their playing ability. (50 mt. dash, 4*10 yard shuttle run, 12 minute run/walk and sergeant jump) were applied to measure physical fitness variables of speed, agility, cardiovascular endurance and explosive strength respectively to establish relationship between variables and playing ability, coefficient correlation was calculated by using Clark and Clark method. Player showed a significant correlation between speed, agility and endurance with their playing ability in hockey.

Miller and Miller (1985), administered five self-report inventories in a field setting with elite net-ball players (N 20). The questionnaire was the sports competition anxiety test, both forms of the state-trait anxiety questionnaire, the profile mood states and the short form of the activation - deactivation adjective check-list. No significant differences were found between the two groups on any psychological factors as measured by these questionnaires. The authors suggest that by themselves, self-report questionnaire cannot be used for personnel selection purposes.

Ghosh, Ahuja and Khanna (1985) undertook a study on pulmonary functional capacities, vital capacity (VC) maximum voluntary ventilation (NVV) forced expiratory volume (FEV) second of 168 sportsman belonging to


different sports activities and of secondary individuals were undertaken for study. It was observed that the pulmonary function capacities of different groups were higher than those of the sedentary group. The mean VC of basketball, boxing, cricket, football, hockey and the table tennis groups. The mean MVV of all the groups except the athletic badminton and football groups and the mean FEV of football, hockey, swimming and volleyball groups were significantly higher than those of the sedentary group. The mean values of all the three pulmonary function capacities of only the hockey group was found to be significantly higher than those of the sedentary individuals. The available reported pulmonary capacity values, except FEV of a few groups of sportsmen studied abroad, were higher than those of their counterparts studied here. These may be due to the ethnic variation as well as the variation in age, body size and level of physical fitness which influences the different pulmonary capacities.

**Sukkasem and Vijit (1984)** conducted a study to compare height, weight, weight residual, skinfold thickness, percentage of body fat, 11 body circumferences, strength, flexibility, reaction time and the resting electrocardiogram of 80 Oklahoma State university male students from Middle East, East and Southeast Asian countries who were selected by stratified random sampling. The results were compared with the United States population norms. A comparison was also made among the foreign standards who had been in the United States less than one year and more than three years. Multiple t-tests were used to determine if any differences existed

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between the groups in the selected physical fitness variables at the 0.05 confidence level. The results of the above study showed that the United States students had a significantly higher mean value of height than the middle east students and also had significantly higher mean values of height and weight than that the East and South East Asian students. The Middle East student had significantly higher mean value of the sum of six sites of skinfold thickness than the East and Southeast Asian students. The Middle East students had a significantly higher mean value of the body circumferences of shoulder, chest, buttocks, thigh, forearm, and ankle than those of East and Southeast Asians. The Middle East had significantly higher mean values of the circumferences of shoulder, biceps, wrist and ankle than the United States students. The East and Southeast Asian students had a significantly higher mean value of shoulder circumference than the United States. The United States students had significantly higher mean values of the circumferences of shoulder, chest, abdomen, buttock, forearm, thigh, knee and calf than Southeast Asians. The United States students had a significantly higher mean values of left and right grip strength than the Middle East and Southeast Asians.

Prakash (1984) conducted a comparative study of selected physiological and physical fitness factors of soccer and cricket players. Fifteen players each from the group of students undergoing special coaching in soccer and cricket were selected. Criterion measures selected were vital capacity, maximum expiratory pressure, pulse rate, systolic, blood pressure, diastolic blood pressure and speed (50 yard dash), shoulder girdle explosive strength

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(softball throw), leg explosive strength (standing broad jump), muscular endurance (chin-ups) and flexibility (toe touch in long sit position). He concluded that well-conditioned collegiate soccer players seem to have potential to develop cardio-pulmonary fitness, muscular endurance as measured by chin-ups and explosive leg power by standing broad jump more than cricket players.

**Pawar (1984)** conducted a study to compare the motor ability of intercollegiate level wrestler and basketball players. The motor ability variables taken for the study were agility, speed, trunk flexibility cardio-vascular endurance, leg explosive strength and arm shoulder strength and the test were shuttle run 50mts run, sit and reach test, cooper’s twelve minute run/walk test and pull-ups respectively on the basics of analysis of the data. The following conclusions were drawn. The basketball players were superior to wrestlers in speed, agility and leg power strength to wrestlers are superior to basket ball players in arm shoulder strength. Wrestlers and basket ball players don’t differ in cardio-vascular endurance and trunk flexibility.

**Dureha (1984)** compared the selected motor components such as speed, agility, explosive strength and endurance with selected anthropometric variables such as height, weight, leg length, arm length, thigh girth and wrist diameter of offensive and defensive hockey players at college level. Subjects were fifty male students from college of Gwalior in the academic session of 1983-84. Statistical analysis of data employed the ‘t’ test so as to compare the

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offensive and defensive players. It was concluded that there was no significant difference between offensive and defensive players of hockey in selected motor and anthropometric variables.

Dey (1984)\(^4\) in his study on selected anthropometric measurements and physical fitness components of offensive and defensive football players concluded that offensive players possess higher cardio-vascular endurance and explosive strength than those of defensive players. Defensive players have significantly higher leg length, thigh girth, height, weight and Crural index as compared to offensive players. The group did not differ significantly in speed, calf girth and poderal index.

Chauhan (1984)\(^5\) conducted a study to compare the selected general motor ability components, i.e., speed, agility, flexibility, muscular endurance, balance, leg strength, arm and shoulder strength, and coordination of women Basketball and Volleyball players. The subjects chosen were women Basketball and Volleyball players of Lakshmibai National College of Physical Education, Gwalior. Fifteen players in each game were selected and the components were tested on the players. The data collected in all the tests were statistically compared by using ‘t’ ratio at 0.05 level of significance. The analysis showed that the women Basketball players were comparatively superior to Volleyball players in arm and shoulder strength. But there were no significant differences between the two groups in speed, agility, trunk flexion, abdominal endurance, balance, leg strength and hand-eye coordination.


Mishra (1983)\textsuperscript{66} was to find out the relationship of selected physical and physiological variables to performance in fifty meter front crawl swimming. Data on the different variables was collected by administering test adopted standard procedure, arm strength was computed with the help of formula given in Roger's physical fitness index, ankle flexibility with the help of goniometer, vital capacity with the help of spirometer, and body surface area with the help of “Du Dios” surface area formula. Analysis of the data revealed that relationship between speed in swimming and selected physical and physiological variables i.e., arm strength ankle flexibility, vital capacity and body surface was very high correlated positively as the X achieved R values were 0.6758, 0.4658, 0.4941 respectively. The required value to be significant was 0.05 level of confidence and 23 degree freedom. Relationship between speed in fifty meter swimming and body surface were not significant as the achieved value was .1710. Within the limitation identified and on the basis of the results of the study, the following conclusions were drawn. There was significant positive relationship between arm strength, ankle flexibility and vital capacity to swimming speed. There was no significant relationship between body surface area and swimming speed.

Krukower (1983),\textsuperscript{67} reported a study in which he attempted to determine the relationship between anthropometric measures selected on the basis of the opinion of track and field performance in running and high jump. The results of the study showed little influence of the skeletal measures to the


height of the jump however a combination of height leg length and breath of
was found to be significantly related to performance in high jump he said that
there are skeletal symmetric peculiar to the track group and they are: Long
legs, assort body and broad feet.

Bale and Naught (1983),88 studied the body build, explosive strength
and cardio-respiratory fitness of a group of 43 top class female Hockey
players and the findings were compared with similar investigations of female
Hockey players and sports women. The Hockey players were then divided into
four groups according to their respective playing positions on the field and
the morphological. Strength and fitness variables were examined in relation to
these field position. The somato types and body compositions of the
forwards and half backs were found similar but both these groups were
lighter, had lower percentage of fat and lean body weights than the backs and
goal keepers. The half backs were fittest both on the tests of explosive
strength and cardio respiratory fitness.

De et al. (1982)89 studied on Physical efficiency tests on Indian male
"Kabaddi" inter-university players. The participants of inter-university
"Kabaddi" competition showed higher values of height, weight and surface
area than average Indian population, indicating better attainment of growth in
them. Further, the values of respiratory efficiency tests like, FEV1, MEFR and
PEFR were also observed to be more in these players, probably due to training

88 P. Bale and P. Mc Naught. “Physique, Fitness and Strength of Top class
89 De A.K., Dasgupta P.K., Panda B.K., Bhattacharya A.K. “Physical Efficiency
The grip strength values were high in comparison to those of Indian football goalkeepers and hockey players.

**Debanath (1982)** compared selected physical fitness components, i.e. speed, extend flexibility, leg explosive strength, gross body coordination and cardio-respiratory endurance of Football and Basketball players. On the basis of analysis of data he found that the Basketball players were comparatively superior to Football players in extend flexibility and dynamic flexibility. The football players were found superior in leg explosive strength, abdominal strength and gross body coordination.

**Smith (1980)** conducted a study of the effects of anxiety on shooting proficiency among college women basketball players. Members of the 1977-78 South Dakota State University Women’s Basketball Team (N=12) were measured on State Anxiety Inventory (SAI), Sport Competition Anxiety Test (SCAT), Pre-game HR, Game field Goal %, Game free throw %, Season field goal %, and Season free throw % SS in group one consisted of players who attempted over 122 field goals during the season while group two attempted 95 field goals or less. Results of ANOVA indicated significant difference between groups (P<0.05). On season field goal percentage and SAI subsequently data analysis throughout his study incorporated only the value from group 1. A significant correlation was found between scores on the SAI and SCAT. Sig. (P<0.05) multiple regression equations to estimate field goal shooting proficiency from selected measures of anxiety produced multiple R's

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ranging from 0.47 to 0.66 and accounted for between 22 and 44% of the variance in performance. A multiple regression equation for predicting free-throw success was not significant (P<0.05).

Kim (1980) studied members of the men’s intercollegiate volleyball team of Springfield College. All subjects completed the sport competition anxiety test (SCAT) during team meeting. Subsequently, each subject completed the state anxiety inventory (SAI) three times, once two minutes before a practice session and once five minutes before a tournament game. It was found that trait anxiety can’t be used to predict state anxiety; the three competitive situations of practice, regular season game and tournament game do not produce different state anxiety reactions, an interaction exists between trait anxiety and the three competitive situations, a positive relationship exists between trait anxiety and tournament state anxiety.

Chattaopadhyay (1980) made attempts to compare the physical fitness of the University level soccer and Hockey players. The criteria measures selected the assigns the physical fitness were resisting pulse rate Cooper Twelve minutes run/walk test and AAPHER youth fitness test battery. He focused that there was significant differences only in fifty yard dash favoring soccer team and pull-up favoring Hockey team. The above study indicates that University soccer players had more speed then Hockey players. Hockey players showed better arm strength then Soccer players.

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Lamba (1979),\(^94\) compared the physical fitness components and physiological variables of offensive and defensive Hockey players at college level. The subjects were sixty male students of four college of Gwalior who participated in 1979 intercollegiate tournaments. Data were analyzed “statistical by using ‘t’ ratio: It was concluded that, 1. The offensive players are faster and have less resting pulse rate and they have more cardiovascular endurance than offensive players. 2. The defensive players have more leg strength than offensive players. 3. There is no difference between offensive and defensive Hockey players in agility, blood pressure and breath holding capacity.

Woodward (1978)\(^95\) observed in their study relating to maximal Oxygen consumption, body composition and anthropometry on selected Olympic male athletes. They observed that the latest rowers and water polo players had significantly larger skeletal width and length measurement. The skin fold measurements showed larger fat folds on the trunk and extremities in water polo players compared to the other three groups leanness of the upper extremity was significantly larger in rowers and water polo players, while that of the lower extremities was significantly larger in rowers only. Total body fat in absolute values was found significantly higher in water polo players, percentage wise there was no significant differences between the groups even throughout water polo players the highest percentage of body fat.


Gladden and Colacino (1978), studied the height, weight, skin folds, vertical jump and maximal anaerobic power of 88 female participants of the 1974 United States Association National Tournament. The volleyball player were (172.2 em.) tall with (68.5 kg.) of weight, with regard to total skin folds. The players were very lean when compared to the national population of females. The final standing in the tournament was significantly correlated with age, height, vertical jump and maximal height on jump. The partial rank correlation showed that height and vertical jump were the major factors correlated with final standing.

Premchand (1977), conducted a comparative study of physical qualities of offensive and defensive football players of college level. He compared speed agility strength endurance, height and weight in offensive and defensive players and concluded that the defensive players were heavier taller and had more muscular power than offensive players, the offensive players were faster and had more endurance than defensive players and 3) there was no significant difference between offensive and defensive soccer players in agility.

Goon (1977), undertook a comparative study of cardiovascular endurance of Football players and endurance runners. He selected 20 college students of age 17 to 19 years. He administered twelve minute run / walk test

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to the Football players and endurance runners. ‘t’ ratio was computed and it was concluded that there was no significant difference in cardiovascular endurance between Football players and endurance runners.

**Martin (1976),**

conducted a study by comparing the selected anthropometric measurements and physical performance between Mexican American and Anglo-American adolescent boys. Also comparison of body size, body structure and physical performance were made between the subjects at adjacent age levels within each individual racial groups. The body size was assessed by standing height and body weight measurements. Body structure was interpreted as upper arm girth, chest girth, abdominal girth, thigh girth and calf girth measurements. The physical performance was determined by selected motor ability tests. It was concluded that the Anglo-American subjects were significantly taller than the Mexican-American subjects. It was also concluded that excluding standing height, the Mexican and Anglo-American subjects did not differ in body size and body structure and also these two races did not differ in physical performances.

**Gupta and Banga (1976),**

studied extroversion, neuroticism and physical fitness. One hundred male students of four personality tests as distinguished by "Maudsley Personality Inventory" of Eysenck, belonging to the same age and academic achievement groups were tested to determine the difference of physical fitness as measured by the modified form of "Harvard Step Test" among the personality types. Results indicated that a extrovert

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group was significantly the highest on physical fitness as compared to all other groups; b. neurotics group was significantly the lower on physical fitness than all other personality groups; c. no significant different was found between extrovert group and normal group; and in the majority of comparisons made in this investigation, significant differences of fitness among the personality types had been found.

Dweek (1976)\textsuperscript{101} conducted a study on the effect of achievement motivation on success and failure. The results of this study showed that Subjects who experienced success have considerably high achievement motivation than those who experience failure; Failure results from lack of achievement motivation rather than lack of ability of the performer; Changes in achievement motivation during competition are under the control of the performer.

Ward, Goppel and Stone (1974)\textsuperscript{102} conducted a study to compare anthropometric measurements between master and first class Olympic weight lifters and to assess if body segments proportionately contributed to performance level. A total of 39 measurements were record which included length, circumferences, age and center of gravity position. The results indicated few statistically significant differences between seven first class and three master Olympic weight lifters. The master were stouter in body type than the first class lifters.


Reid (1974), in his study examined the relationship of flexibility, strength and anthropometric measurement of lower limb to the skating speed of hockey players. Seventeen university hockey players were assessed for leg and grip strength using cable tension method, lower limb flexibility by using Ceighten’s flexometer technique anthropology of leg and skating speed understanding the flying start conditions with and without a stick over two feet distance, 40 feet and 25 meter. The strength, flexibility and anthropometric measures were the independent variables and the skating speed was the dependent variables. The data were analyzed using Pearson product moment and step wise R statistical methods (P< .05). The results indicated that flexibility was specific to each point measured there was a general strength factor and a general body type for skating two of the skating speed tests encompassed many factors of other six, flexibility was related to strength and anthropometry.

Brengden (1973), made a comparison of physical fitness and anthropometric measures of pre-adolescent, Mexican American and Anglo American males. Three hundred Anglo American and three hundred Mexican American males between age of eight and eleven years were selected as subjects. AAPHER Youth Fitness test was used to measure physical fitness. Thirteen anthropometric measurements were taken. These were standing height, sitting height, weight, shoulder width, arm length, chest girth, waist girth, hip width, thigh girth, leg length, calf girth, foot length and arm girth.


The findings revealed significant differences between the Mexican American and Anglo American males in certain physical fitness items anthropometric measures and varies physical fitness items were significantly higher for the Mexican American males the result indicated that Anglo American males are superior in performing selected physical fitness items.

Saha (1972),\textsuperscript{105} made a study to compare the selected physical fitness variables and anthropometric measures of tribal and non-tribal student's items of AAHPER Youth Fitness test. i.e., 50 yards run, 4x10 yards shuttle run and 600 yards run/walk and selected anthropometric measurements i.e., chest girth, height, weight, upper arm length, thigh girth and calf girth. In all tests and measurements the mean score of the composite score of tribal students were higher than their non tribal counter parts, but none of difference in means was found statistically significant at 0.05 level of confidence.

Malhotra (1972),\textsuperscript{106} studied the functional capacity and body composition of the throwers, jumpers, sprinters and middle and long distance runners. The trackmen and jumpers were found to have a higher lean body mass with less fat content than the throwers who were tall and heavily built. The middle and long distance runners had highest and the throwers, the lowest maximum oxygen intake capacity values in terms of body weight and lean body mass. Similarly, the trackmen had lower maximum heart rate than other groups of athletes.


Johnson (1972) conducted a comparative study of physical qualities of offensive and defensive Football players of College level. He compared agility, speed, strength, endurance in offensive and defensive players and concluded that Defensive players were heavier, taller and had more muscular power than offensive players; Offensive players were faster and had more endurance than defensive players; there was no significant difference between offensive and defensive Soccer players in agility.

Nemour (1971) did a comparative study of anthropometric measurements of Caucasian and Negro boys and girls to find out the differences in anthropometric measurements and at the same time differences in standing broad jump, medicine ball put, and zig-zag run performance of the boys and girls of both races. A total of 900 subjects were taken. Subjects were of different age groups of six to ten years. Anthropometric measurements were standing height, sitting height, weight, length of arm, length of fore arm, length of the hand, length of the upper extremity, length of the thigh, length of the leg and length of the lower extremity. He found that at the age of six to eight and ten years, boys differed from girls in most anthropometric measurements. However, there were no differences in standing height, leg and lower extremity length, Negro boys and girls had longer appendages and were taller than Caucasians. Negro boys and girls were not superior in the events of power and agility.

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Miller (1971) compared the effect of individual and team sports programmes on the motor ability of inter collegiate freshmen. Barrow's Motor Ability Test, with items of zigzag run, standing broad jump; medicine ball put, 60 yards dash, soft ball throw for distance and wall pass was used to measure the motor ability. The team sports included were basketball, soccer, softball and volleyball; where as the individual sports were badminton, bowling and tennis. After the experimental period was over, subjects were retested on Barrow's Motor Ability Test. It was concluded that team sports had a significantly different effect only on the 60 yards dash team item. The ‘t’ test analysis indicated that the team sports had a significantly different effect on the wall pass test and the ‘t’ test analysis indicated the effect of soccer and volleyball was significantly different. The Scheffe's Test was used to test the significance of the two groups. Correlations were obtained for each of the different age levels and for the total sample population on the following: physical fitness and anthropometric measures, age and physical fitness measures, age and anthropometric measures. The significant difference between the correlations was tested by two techniques. The report showed that there exists difference in physical fitness and anthropometric measurements in the two subcultures of the United States. Both groups exhibited higher body measurements and fitness scores at each succeeding age level. This denotes a relationship between physical fitness and physical growth. Age as the predictive factor was important to both the groups.