CHAPTER - II
REVIEW OF LITERATURE

Review of related literature is a crucial aspect in the planning of any research study and the time spent on such a survey is invariably a wise investment. It serves as a clinic between the old and new and between the known and yet to be known. The researcher wants the known background story "not only does he" say book Walter and Book Walter (1979) "need to know what has been done and how it has been done in the subject areas, but he also need to know the degree of success that was found in the use of the research techniques or methods". It is an exciting task calling for a deep insight and clear perspective of the over all field. It promote and enables avoiding unnecessary duplication. It also provides comparative data on the basis of which evaluation and interpretation of the significance of one's findings is worked out.

In fact, the success of any new research project, to a large extent, depends upon how well it is linked with previous researchers of the same kind. Divergences and convergences in the problem; especially in its procedures and processes in cannot be justified without reference of the past story.

The review of related literature available in the libraries of Kurukshetra University. National Institute of Sports Patiala, Lakshmi Bai National University of Physical Education Gwalior, MDU Rohtak, CDL University Sirsa and Punjab University Chandigarh, Literature available form the publication of friends (India) Delhi. This chapter includes a resume of reserved studies and other literature relevant to the present studies. The following sequence has been adopted by the investigator to
display the related and critical studies, related to the problems:

1. Studies on Anthropometric Variables

2. Studies on Psychological Variables.
   - Anxiety
   - Adjustment

3. Studies on Physiological Variables

4. Mixed Studies on Compared Studies

**STUDIES ON ANTHROPOMETRIC VARIABLES**

Kohlrausch (1929) has reported the measurements made on approximately 300 athletes at 1928 Olympic at Amsterdam. In addition to the measurements of height, weight, vital capacity, thorax circumferences etc., a number of ratios were also calculated. It was found that the differences existed in body dimensions of different sportsmen of different events.

Metheny (1939) studied the differences between the Negro and White athletes in respect of their body measurements. The results indicated that superiority in certain sports events might be attributed to those differences.

Cureton (1941) has stated that in general, people with long legs and long arms, and with relatively short and small trunks were physically weak types in long-sustained heavy work, but they might show great speed and endurance at high levels of athletic activity. Long third class levers are noted for speed and range of action as well as for their efficiency for force.

Cureton (1951) studied champion athletes and found that typical track men are slight in skeletal framework with a relatively longer upper leg ratio and trunk relationship. He also noted that most good sprinters
have narrow hips, and that the more ponderous men with longer and larger trunks, but with relatively short limbs, are mostly to succeed in weight-lifting, wrestling, gymnastics and diving.

Cureton (1954) tested 55 middle aged athletic champions and compared them with 400 middle aged men with normal youngmen. The former champions with more mesomorphic (3-5-4), more linear in skeletal build, less fat. With wider shoulders, smaller hips and smaller glutial and abdominal girths. They also had stronger dynanometric strengths and better cardiovascular tests.

Tanner and his colleagues (1960) conducted a study of the anthropometric measurements of the Olympic athletes who participated in 1960 at Rome. They studied the athletes of different races but of the same events in an attempt to study their height, weight and other body measurements. They were compared with each race and the whites were compared with Negroes. It was found that Negroes were larger than the Whites in some measurements, their arms were longer than Whites.

Morris (1961) studied the structural and functional differences between women athletes and unselected college women. Significant differences were found between all strength tests, vital capacity, height and mesomorphy, ectomorphy. There was clear evidence that the total strength and leg length per pound of body weight were more important factors in performance than the body weight and strength alone.

Clarke and Degvits (1962) compared the skeleton ages and various physical and motor factors with the pubescent development of 10, 13, and 16 years old boys. Physical maturation was differentiated by pubescent assessment most effectively at 13 years of age.

Sidhu and Anand (1971) 42 athletes and 46 non-athletes in which
the former were found to be taller and heavier than the latter. The non-athletes were seen to possess higher amounts of subcutaneous fat than the athletes.

Muthiah and Venketswarlu (1973) studied the Indian track and field athletes and noticed the throwers to be heavier, taller and older than other athletes. Among runners, the age increased and the height weight decreased with the increase in the distances they ran. The jumpers and the hurdlers were taller and heavier than sprinters but were shorter and lighter than throwers. The decathlon athletes were the second heaviest as they were all rounders:

Sinning and Lindberg (1972) reported that college women gymnasts had proportionally greater muscle mass and concentration of muscle mass in the upper trunk and shoulder girdle. They also found women gymnasts to be smaller in skeletal diameters and circumferences of the lower trunk and the limbs. They reported that upper trunk and upper limb circumferences were greater in gymnasts in comparison to the general population.

DeGaray et al (1974) conducted a comprehensive study on the Mexico Olympians. All their track groups had similar somatotype distributions and were concentrated mainly in the ectomesomorphic category. Sixty-one per cent of their throwers were endomesomorphs, the rest being dominantly mesomorphs. On the other hand, the jumpers, walkers and decathlon athletes had no dominance in mesomorphy.

Wilmore and Brown (1974) have emphasized that the athletes in sports requiring great energy demands have less fat than their non-athletic counterparts. The percentage body fat of top Indian players (Malhotra 1974) has been estimated at 8.99% according to Pascole's
(1956) questions Brozek's (1951) formula whereas De Pranfero et al (1970) quoted a mean value of 15% for 16 Argentinian Hockey players. Thus, it would appear that South Australian State level players are comparable to Argentinian players but have a higher percentage of body fat than Indian players.

Widhu and Wadhan (1974) worked on footballers who were found to be of average height with larger trunks and smaller lower extremities than the controls. They also had more of lean tissue in the extremities than the latter.

Sodhi et al (1975) took the upper arm and some anthropometric measurements of 22 throwers and compared them with 45 normal non-athletes. The throwers were found to be significantly taller and heavier with bulkier builds of larger circumferential measurements and skeletal measurements. Their lean body mass was greater than that of the controlled sample. Roentgenogrammetric assessment displayed that the constant throwing exercise had resulted in greater development of the upper arm muscles, especially the triceps.

Shoudell (1975) has established the relationship of selected motor performance and anthropometric traits with successful volleyball players. He used a six item battery for this purpose. He found that power appeared to be the most significant factor in successful volleyball performance.

Elite distance runners (Pollock et al 1977) showed smaller values for both thigh circumference and skinfold (51.9± 2.3 centimeters and 6.1± 1.8 millimeters) than did average young men and the different athletic groups. The lower skinfold measures for thigh for the athletes appeared to be related to their per cent fat and were substantially lower than the measures for average young men. On the other hand, thigh
circumference for elite distance runners different form that of the other athletes and related to differences in free for weight.

Sodhi (1980) noted that physique and body composition are specific in athletes and sportsmen of different physical activities. He showed that there is some specific mechanical advantage of typical characteristics in most of the athletes and sportsmen.

Bhatnagar (1980) conducted a study on 23 rural sportsmen (athletics-8, volleyball-8, kabaddi-7) of Madhya Pradesh pertaining to their weight, height, sitting height and subcutaneous tissue folds at biceps, triceps suprailiac and subscapular region. They were found to be lighter, shorter and with less amount of fat as compared to normal urban Punjabis. Morphological differences pertaining to supportive activities indicated that volleyball players were lightest, shortest with maximum amount of fat compared to kabaddi players and athletes whereas kabaddi players were heaviest and tallest among all the rural sportsmen of Madhya Pradesh.

Sodhi (1980) studied the top ranking Indian national basketballers and found that with the increasing standard of the participants the average stature was greater. The top class teams in the world have a greater average height than the teams of lower standard. A significant, correlation was seen between the stature and performance in the competition. The value of correlation was very high with the field basket scores. Thus, the greater the stature of a basket baller the better will be his performance,

Brongdon (1983) compared the physical fitness and anthropometric measurement of pre-adolescent Mexican-American and Anglo-American males. 300 subjects were tested from each group of AAHPER Youth Fitness Test and thirteen anthropometric measurements
were made. The findings revealed significant differences between the Mexican American and Anglo-American males in certain physical fitness items and anthropometric measures. When the single factor of age was correlated with each of the individual physical fitness items and each of the anthropometric measures, few significant differences were evident. The results indicate that the Anglo-American males are larger in gross body size and they were superior in performing selected physical fitness items. Both groups exhibited higher body measurements and fitness scores at each succeeding age level. That denoted a relationship between age, physical fitness and physical growth. Age as a predictive factor is equally important to Anglo-American students.

Burke and Bush (1985) studied physiological and anthropometric measures of young women who had been training regularly by running approximately 50 mile per week for two years. Anthropometric measures included selected segment lengths, diameters, skinfolds and circumferences. He concluded that these women athletes were average in height, while lighter than normal for their age and sex, having a high component of ectomorphy, having a small overall skeletal framework than normal and low in subcutaneous body fat for their age and sex.

Gooden (1989) conducted a relationship study on selected anthropometric measurements of leg and foot to speed and vertical jump of male collegiate track and field athletes. Ss = (n =32) were assigned to five groups according to their respective events: short sprinters, long sprinters, middle distance runners, distance runners and jumpers. All the subjects were exposed to a one week training period before the testing of the vertical jump and 50 yard dash. An ANOVA was used to determine difference between performance scores of all five groups in the vertical
jump, 50 yard dash and selected anthropometric measurements. The Newman-Koal follow up test was employed to make multiple comparisons and a multiple was used to determine the relationship of selected anthropometric measurements to vertical jump and 50 yard dash. There was a high positive relationship between speed of the 50 yard dash and vertical jump. There was no significant relationship between the 12 anthropometric measurements and speed in the 50 yard dash. The short sprinters and jumpers performed significantly greater in the vertical jump and 50 yard dash when compared to other groups. The short sprinters and middle distance runners performed significantly greater in vertical jump and the 50 yard dash when compared to the distance runners.

Carter (1988) in his boom mentioned that the average judo competitor is of 23.4 years old, 173.1 cms. tall and having a weight of 76.5 kg. has a somatotype of 2.0-6, 4-1, 3 (54% endomorphic mesomorphic) and skinfolds totalling 44.1 mm. when compared to other weight classified sports. Judo competitors are mostly like wrestlers in age and size variables. They are younger and have a lesser arm girths than weight lifters. They tend to be more endomesomorphic in upper weight classes compared to lower ones. Their large proportional mass compared to the non-weight classified sports, seems to be accounted for by their high mesomorphy.

Novek et al (1986) assessed eight distance runners, seven swimmers and five gymnasts. The working capacity was determined on bicycle ergometer, oxygen intake, carbon dioxide, respiratory rate, pulse rate and R.O. were determined by Siregmost - FD 88. Vital capacity was measured by a spirometer with an automatic read out. Total body water was determined from the ratio of D2O to H2O by mass spectrometry.
Lean body mass was calculated from total body water assessing 73.2 per cent hydration. Anthropometrical appraisal of leanness-fatness included subcutaneous fat-fold measurements and calculations of lean diameters of the limbs. In relative values distance runners showed significantly higher oxygen intake which was also achieved to significantly higher work loads compared to swimmers and gymnasts. Vital capacity was significantly higher in favour of swimmers percentage wise. Various subcutaneous skinfolds were higher in swimmers thus substantiating findings of biochemical determinations of total body fat.

Joseph (1993) determined the relationship of power, agility, shoulder flexibility, arm length and leg length to volleyball playing ability. Thirty male volleyball players of the Lakshmibai National College of Physical Education, Gwalior were selected as subjects. It was concluded that arm length and leg length were reliable variables in predicting playing ability of male volleyball players.

Benny Kuriakose (1994) conducted a study of anthropometric measurements and body composition variables on judo players. Nine anthropometric measurements and three body composition variables were taken for this study. Judo players ability was taken as the criterion measure and all the variables were taken as the independent variables. Pearson's Product Moment Correlation was used to find out the relationship between anthropometric measurements and criterion measure. A multiple correlation was computed to find out the combined effect of the anthropometric measurements to judo performance. He concluded that: (i) performance in judo is positively and significantly related to chest girth; (ii) judo performance is negatively and significantly related to ponderal index which means that for better judo
performance judoka should possess greater body weight in proportion to
body height, (iii) Lean body mass, upper arm/force arm ratio and sitting
height are the most important predicting variables under the limitation of
this study.

Matsumoto and associates (1999) studied junior high school
judokists on 15 anthropometric measurements and 13 functional test
items. They standardized the test items and suggested the methodology
extensively.

The purpose of House and Associates (1989) was to determine tire
validity of 23 anthropometric equation for estimating body composition
and minimal wrestling weight in high school wrestlers. A total of 409
high school wrestlers (M. age ± S.D. = 16.42 ± 1.03 years) volunteered
for this study. Twenty-three anthropometric measures including eight
skinfolds, nine circumferences and six diameters were obtained from
each subject. The mean body density, determined from underwater
weighing was 1.0748 ± 0.0100 gem.3 The cross validation, analyses
indicated that the quadratic skinfold equation of Lohman resulted in the
most accurate estimation of body density. The total error, constant error,
standard error of estimate, and Y for this equation were 0.0077 gem.3 -
0.0003 gem3, 0.0076 gem3 and 0.65 respectively. Further more, the
results of this investigation indicated that the minimal correlating weight
equation of Tcheng and Tipton resulted in total error values (5.54 to 6.06
kg.) which were too large to be of practical use for high school wrestlers.

Woodward and Associates (1998) in a study relating to maximal
oxygen consumption, body composition and anthropometry on selected
Olympic males athletes observed that the tallest Rowers and Waterpolo
players had significantly larger skeletal width and length measurements
showed larger fat folds on the trunk and extremities in Waterpolo
players- compared to the other three groups. Leanness of the upper extremity was significantly larger skeletal width and length measurements. The lower extremities were significantly larger in rowers only. Total body fat in absolute value was found significantly higher in Waterpolo players.

Lavonne (1996) examined the relationship of chosen structural-maturational variables to throwing performance in the light of sex differences and developmental differences. The structural maturational variables chosen were height, weight, arm length and subcutaneous fat. Four measures of throwing performance were used to identify throwing ability of the subjects. These measures were velocity, distance, accuracy and quality of throwing form. Subjects were 146 first and fourth grades enrolled in an elementary physical education programme. Results indicated that there were differences between boys and girls on throwing performance variables and structural-maturational variables. A significant relationship between arm length and throwing composite was found for first grade girls. For fourth grade boys, a significant relationship was found between the two structural-maturational variables of arm length and weight and throwing composite. The structural maturational variables were found to be a significant predictor of distance throwing for first grade and fourth grade boys.

Sprague (1995) examined several ways of the relationship of swimming speed to physical measurements in all four competitive swimming strokes. The actual 100 yard free style times and the age predicted residuals of those times were used as dependent variables. The physical measurements were height, weight, sitting height, lower leg length, foot length, arm length fore arm length, waist girth, chest girth, hip girth, upper arm girth, thigh girth, wrist girth, ankle girth, hip width,
shoulder width, chest thickness, bicep skinfold, scapular skinfold, shoulder flexion, ankle flexion, knee extension, elbow extension, vital capacity and centre of gravity, other variables recorded included length of time in competitive swimming, months per year spent in workouts, number of workouts per week, amount of participation in other competitive sprinters and age. The stepwise method of multiple regression was used in all analyses. The most consistent variable overall was time in competitions. It was statistically significant in all fourteen analyses. The most consistent physical measures were foot length and bicep size. Each was found significant in at least one analysis for each of three strokes. In each case longer feet were associated with slower timer and larger biceps were associated with faster timer.

L.Wilbar Martin (1995) conducted a study by comparing the selected anthropometric measurements and physical performance between Mexican-American and Anglo-American adolescent boys. Also comparisons of body size, body structure and physical performance were made between the subjects at adjacent age levels within each individual racial group. 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 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.

Siret and Pancorbo (1999) undertook this study to identify some anthropometric indicator with influence on competitive results from young elite female swimmers specialized in 100 and 200 m. free style
events. Seventy eight swimmers were studied. Weight, height, four diameters, four circumferences and six skinfolds were determined on these athletes. Based on these data, the somatotype, body composition and other indices like the activity corporal substances (AKS), gluteal circumferences related to height (GC/11), Brocas index (KP) and body surface area (BS) were assessed. These assessments were submitted to factor and lineal correlation analyses with the best time achieved by the athlete at the moment of anthropometric study. The indicators that were positively correlated (P 0.05) with the times are as follows: lean body weight (LBW) and BS while endomorphy was in negative sense. Factorial analysis revealed four bipolar factors which were able to explain the 71.6% of variance, showing the corresponding to competitive results, a strong relation to weight, height, lean body weight. Broca's index, activity corporal substance and mesomorphy which point out the importance of considering these indicators when choosing sport talents at an early age.

Stanley J. Hunt (1999) in his study on junior high school boys and girls concluded that chronological age, standing height and weight are of little value as classifiers in performing the minute sit-up, standing broad jump and 300-yard run in Manitoba's physical and motor performance test.

Kansal et al (2080) conducted a research on the physique and body composition of Indian University Soccer players. The zonal champions of the all India Inter-University Football Tournament and the runners-up of the North Zone were taken as the subjects. They concluded that defence line players were significantly taller and heavier and had higher values to most of the parameters examined. The four bicondylar diameter
accompanied by better development of thighs and calves was seen in comparison to the defensive players. The forward line players had also slightly less body fat and more of lean body mass.

Sodhi and Sidhu (2001) in their book mentioned that the wrestlers are found to have longer upper extremities, a longer and larger trunk and shorter lower extremities. The longer upper extremities are advantageous to them for an easy reach in many of the technique holds of wrestling and help in having stronger arm grip for catching the larger trunk of an opponent. The longer trunk and shorter extremities bring down the centre of gravity and thus help in increasing the stability of a wrestler. Moreover, the longer and larger trunk adds in the strength of their region of the body which seems essential especially when during the fight, one wrestler is in the hold of another.

Callister et al (2001) studied eighteen male and nine female nationally ranked judo athletes to construct profiles that would provide some understanding of the physiological capacities underlying successful judo performance. Body composition, aerobic capacity, idokinetic elbow and knee flexion and extensor strength and muscle fiber size and composition of the vastus lateralis were examined. Higher ranked males (except heavy weight) differed from lower ranked males in percentage of body fat (5.1 ± 0.6 Vs 8.2 ± 0.8 P 0.05). While more successful females tended to have greater upper body strength than less successful females. More striking, however, was that the characteristics examined varied (P 0.05) as a function of weight division for both male and female athletes. As weight division increased, percentage of body fat increased (r = 0.64, 0.72). Among females in particular athletes in the higher weight divisions were stronger relatively to LBM than those in the lower
divisions.

bodies (N=33). The subjects

Bhatia and Others (2004) conducted a study by comparing the anthropometric measurements and body composition between 40 women (20 sprinters and 20 throwers) subjects in the age group of 18 to 25 years, who had participated in University athletic meet K.U.K. The body size was assessed by standing height and body weight. Body structure was interpreted as girth, width, body fat, body density of various body segments. Body density was estimated by Durnin and Rehman's equation (1967), Siri’s (1951) formula used by Durnin and Rehman was applied in estimating the percent of fat. The results were as follows; throwers have more muscular body than sprinters. Throwers have larger diameters than sprinters, which indicate a better development of various regions of throwers. The skin fold measurements are larger in the throwers as compared to sprinters. These measurements show maximum fat deposition in throwers.

Musaiger et al (2005) analyzed body composition of different groups of athletes in Bahrain. Three hundred four athletes were selected from first class clubs related to four common sports football, handball, volleyball and basketball and compared with fifty three non-athlete adults weight, height, mid-arm circumference and skin fold thickness were measured to significantly greater in vertical jump and the 50-yard dash when compared to the distance runners.

Bandyopadhyay (2000) found out the relationship of selected anthropometric measurements, physical fitness and motor ability to soccer skill performance. All subjects were tested in selected anthropometric measurements, which were chest girth, upper arm girth,
thigh girth, calf girth, height and weight. They were also tested in AAHPER YOUTH fitness test for assessing motor ability and Mc Donald soccer skill test for measuring soccer skill performance. The findings indicated that the Mc Donald skill performance had a high correlation with physical fitness and motor ability. The obtained value was .86 and .89 respectively. Those values of correlation were statistically found significantly at .05 level of confidence. As one of the findings was that there was a high correlation in physical fitness level as obtained from AAHPER youth Fitness Test with soccer skill performance.

Sinha (2001) found out the relationship of selected motor traits and anthropometric variables with performance in AAHPER Basketball skill test. To establish relationship between selected motor traits and anthropometric variables to performance the AAHPER basketball skill test, the co-efficient of correlation (r)

Ghai (2004) conducted a study on the relationship of selected physique characteristics and motor ability components with performance of gymnastics. Twenty male gymnasts, who have represented different universities in all India Inter-university competitions, were selected as subjects for the study. The subjects were tested for all the characteristics and motor ability components such as height, weight, chest girth, thigh girth, upper arm girth, strength, flexibility, agility, and dynamic balance were significantly corrected with the performance in gymnastics and physique characteristics were not significant to the performance of gymnasts.

Singh (2009) has studied the kinanthropometric measurements, aerobic and anaerobic fitness among the badminton players. He has made study on 88 badminton players drawn from the northern states of India
with the random sampling device and formed three groups i.e. national and inter-varsity, state and inter-varsity, district and inter-college level players. He has taken 18 kinanthropometric variables and applied 12 minutes run and walk test as per results of the study, he drew the following conclusions, (i) He found no significant difference among the three group of badminton players in their height, length of arms, length of torso and length of legs but found significant difference in weight, circumferences, measurement of chest, upper arm, thigh, calf and body density. He also found significant difference in body fat percentage, (ii) With the interpretation of results he observes that there exists significant difference between aerobic and anaerobic fitness among the three groups of badminton players.

Mewara (2010) conducted the study of motor fitness and selected anthropometric variables in relation to their playing ability at different levels of basketball players. He took 180 basketball players dividing into the groups consisting of state level, inter-varsity, national and international level. The playing ability was judged by judging rating scale in the playing situations and tested basketball skill with Johnson Basket Ball Skill Test battery. As per results, he reported that the international level basketball players were significantly better than other group players, i.e. national, inter-varsity and state level and skill performance of the international and national level players were found better among anthropometric parameters, arm length, leg length, age and weight and the motor fitness parameter such as strength, flexibility, endurance, static balance, visual reaction time etc The mean values of the international level players were better than the other three groups.

He also predicted that the independent variables age, motor fitness,
skills and height are the more contributing factors in over all basketball game.

Chauhan and Chauhan (2007) have made the study to find out the relationship and anthropometric variables in execution of explosive arm strength of volleyball players. For this they selected 40 college volleyball players, who participated in the Kurukshetra University, Kurukshetra inter-college volleyball championship. They were in the age group of 18 to 25 years all the layers appeared for body composition variables and explosive strength test of basketball throw with both hands. To find the relationship product moment method for correlations and Wherry Doo equation for the prediction of explosive arm strength of Volleyball players were used as statistical tools. In the findings, they found age; weight and linear measurements have positive correlations at 1% and is contributor to improve the explosive arm strength of volleyball players in the same way. All the diameters also possess positive and significant correlation with explosive arm strength at 1% level and are helpful to improve the performance of the player. The skin fold measurements also have positive and significant correlations with explosive arm strength and 1% level specially in biceps, sub scapular, thigh etc., whereas triceps, midaxillary, supra iliac and calf skin folds have positive correlations at 5 percent level and are contributor to improve the explosive arm strength.

Johnson (2005) investigated 208 collegiate wrestlers. Subjects were classified as successful and unsuccessful according to their win-loss percentages. A second clarification was by weight (light, weight, middle weight and heavy weight). All the subjects were measured for height, weight, arm length and leg length. The unsuccessful wrestlers had longer
legs than the average and successful wrestlers. Analysis of multiple regression showed that no combination of the independent values was successful in predicting success.

Venkateswarlu (2006) conducted a research on national level 100 kabaddi players, 120 basketball players, 100 track and field athletes and 100 non-athletes. Their age in years, height in cms. and weight in kg. were recorded'. Their skinfold thickness, lean body mass, body fat content, upper arm and lower arm circumferences and their respective diameters were determined. Basketball players and throwers were the tallest of all. Throwers were not only the tallest but also the heaviest. Distance runners were the lightest. Kabaddi players and throwers had the highest body fat per cent. Throwers, kabaddi players and sprinters were muscular in their upper extremities because of which their scores in the corrected upper and lower arm diameters were greater than those of basketballers, jumpers, middle distance and long distance runners who seemed to be lean and lanky.

William Yoest (2008) concluded that age, height, lean body mass and body surface area did not significantly limit performance in Ohio State University Step Test. However, body composition representing body fat limited the performance of college men only. In adolescence scores in the step test improved longer percentage of lean body tissue.

Sady et al (2006) compared the body composition and physical dimensions of 23 young, experienced wrestlers with 23 school children. Standard densitometric and anthropometric techniques of each group. The wrestlers were 4 kg. lighter (P 0.05) and had a smaller per cent fat than the comparison, group 13.3±0.6% and 20.0+ 1.13% respectively). The weight difference between groups were due to the larger fat weight
of the comparison group since lean weight differed by only 0.8 kg. Fat differences were circumferences of the composition group, were noted in diameters. It was concluded that compared to other children, young experienced wrestlers had similar skeletal structures and lean body weight. The comparison group possessed more body fat.

Kishore (2006) conducted a study in which he took 30 inter-university weight lifters. Their anthropometric measurements such as arm length, leg length, thigh length, trunk length, thigh girth, calf girth, upper arm girth and forearm girth and skinfolds were measured. He concluded that there is significant relationship between thigh girth, trunk length, upper arm girth, forearm girth and lean body mass and weightlifting performance. There is negative relationship between leg length, thigh length and weight lifting performance. There is no significant relationship between arm length fore leg length, calf girth and weightlifting performance.

John D. Read (2007) studied the anthropometric and strength characteristics of the high school competitive gymnasts. The upper and lower one third (N =26) of a group of gymnasts as determined by performance were used as subjects. Good gymnasts were found to average, significantly less than poor gymnasts in measures of standing height, sitting height, iliospinal height, arm span, lower extremity length and left and right upper arm extremity length. Good gymnasts were significantly more ponderous than poor gymnasts and were found to possess a proportionally greater chest breadth than chest depth.

Forrest A. Dologher et al (2008) noticed a series of body build and body composition variables on a group of 29 female ballet and modern dancers. Comparisons were made between the dancers and other type of
female athletes. The body build of the dancers were definitely different from that of non-dancers. The dancers had lower body weight, lower LBW, smaller deltoid, biacromial, biliac, bitronchateric and wrist diameters and less body fat than the non-dancers. Compared to other type of female athletes, the dancer had more body fat and less LBW somatograms of the dancers indicated that their body builds exhibited good symmetry

In their study on national level archers, Sundararajan, Pande and Salaudden (2006) concluded that physical measurements i.e. height, weight, bi-acromial diameter and arm length were correlated with the performance of the individual archer at the varying distances. Further, it was concluded that the physical measurements correlated also with the total performance scores.

Debnath (2006) conducted a study on 41 gymnasts who participated in competition of the National Junior Gymnastics Championship. Age, weight, height, biacromial, betrochantorion, humorous bicondylar and femur bicondylar diameters, upper arm, forearm thigh and calf circumferences and biceps, triceps subscapular, suprailiac, and calf skinfolds were obtained one each subject. They concluded that the high level junior performers in gymnastics possess significantly lighter weight; smaller thigh circumference, lesser for percentage and higher lean body mass percentage, mesomorphy and competition performance than mediocre group. It was also concluded that the high level performance group possesses significantly wider biacromial diameter, upper arm circumferences, and greater mesomorphy and competition performance than the low level performance group.
STUDIES ON ANXIETY

Anxiety refers to unpleasant emotions and involves as state of tension and discomforts. Anxiety as powerful influence in contemporary life in increase recognized and main gestation of current concern with. Anxiety Phenomenon is obviously reflected in literature. The arts Science and Religion as well as in many other culture. Anxiety is found as a culture explanatory concept is all most all contemporary theories personally and is required as principal causative agent for such diverse consequences as insomnia, immoral and sinful acts fear and convert anxiety have perhaps always been part and Lot, apparent not until the twentieth century did. Anxiety emerge as an explicit pervasive problem. The cold war hit persistent thereat of total destruction in an atomic age.

Martin (1974) investigated several facts of anxiety and motive Performance, as They related to its sports competition it self. The results of investigation showed. They athletic experience pre-estimates daily Period completion had an effect upon the performance of a complex motor response, time task.

Mull (1983) stated that the relationship between Anxiety and performance has an explained by one of two theories. Drive Postulates a linear relationship, arousal and performance as the arousal level of person increases the performance will also increase. This seems the viable explanation for movements of a short, explosive of ballistic nature (Singer 1975).

Myers and Bean (1968) pointed out that devastating effect of worries, anxiety, fear of failure, threats and various pressure in competitions, combats and stresses of modern life increased the amount of mental illness, which engenders a feeling of helplessness and a desire
to withdraw from the harness of reality. It atro brings subjective emotional discomforts anxiety dissatisfaction, unhappiness depressive moods and exaggerative shifts of more and ultimately personality imbalance appear.

Nelson and Longer (1983) In their study using in college basketball team, examined some of the psychological variables resent among athletes in competitive situations. They assessed anxiety level of the team members by using the Taylor manifest anxiety scale. The results showed the performance of athletes with extremely high level of anxiety was poor. They also found that athletes why scored low in anxiety did perform well either perhaps of a Lack of dedication. The athletics’ emotion state be love competition may very determine his performance level. Many athletes report before the contest, such worry is natural but serves so constructive purpose. Too much worry results in anxiety on fear the outcome is certain to be harmful to athletic productivity. As mentioned above, however, a certain amount anxiety acts to prepare the athletic for completion.

A study completed by Lampman (1987) Supports the value sightless in anxiety before completion. Members of the university of Florida varsity swimming team were given anxiety test before the season and another approximately an hour before the COMPETITION. It was concluded that rise in anxiety before competition improved performance and that performance was better if the athletic preempt anxiety level- as at least equal to or slightly above his pre-season anxiety level.

Huddceston and Gilki (1991) using martin's competitive stage anxiety inventory (E.S.A.I.) attempted among other things to examine whether there was a difference in A- state between male-female track.
was a difference. In A state between male-female track and field athletic based on skill felt. That their lack of significant results may have partially due to the small number of subject in study or due to the fact that the skill difference between the groups was great.

Novacayk's (1998) conducted the study on 103 eight grate athletic with both. The sports competition anxiety test (S.C.A.T.) and the shot form of state anxiety inventory (A.I.) were administrated to all subjects. Subjects were given to before and after practice. Game and play off game. There is significant difference among competitive situations between pre-test and the post test situations.

In deter many the level of tension for each endeavor which will produce optimal results, consideration must be given. The anxiety level that the athletic normally operate under and so to the nature of the task. An extremely aroused state serve or productive ends in relatively uncomplicated skills in valuing primarily strength and endurance. In more refined activity, when the body needs to be under control at all times, a moderate aroused state if needed. Competition in athletic unusual demands on the athletics resources. Little that the higher proficient athletic is one who rates not only supers but also emotional controls all sorts of circumstance. In fear, his skill reflects his emotional behaviour in part.

It is clear to most peatie involved in the various states of short. That intense competition creates verging is of anxiety with in performers. What is also becoming, obvious is the fact that some performers react adversely to completive situation by reaching states of hyper anxious non which often results in the in a highly to achieve optimum levels of performance (Martin and Spilberger 1996).
The skills or mechanical aspect of a sport are practiced over and over, but in competition, skill are subject to outside infancies. He athletic works under conditions that are highly stressful and the extent to which. He can be stimulated and yet-remain in control and his movements will determine his output.

Anxiety is a complex state characterized by general fear of foreboding usually accompanied by tension. It is related to apprehension and fear and is frequently associated with failure or anticipated. It has to do with inter-personal and social situation feeling or reflection and are usually a part of anxiety.

According to Forst (1994) Anxiety is an uneasiness and of the boding often when a person is about to embark on a hazardous venture. It is often accompanied by desire to excuse" to the stress and stains of life and is caused by reactions in an attempt to meal. Those difficulties.

The symptom in anxiety state may be expressed by comprehension, gloomy mood, foreboding, fear of dying, feelings, in security and general excitement.

Fatigue Insomina, gesture- intestinal disturbance and depression of spirits are found in many individuals exhibit, cardio-disorders, emotional stability, pre-occupation panic state, subjective thought, disturbance strange fears and guidelines etc. are noted in many cases. Many anxiety ridden persons often complain of a general loss of interest and an in highly to concentrate or think. Other symptoms of anxiety inclusive heart palpations tremor of the hands, excursive perspiration and physical symptoms. Like an increase in the frequency of scale tremors in various parts of the body, increase in eye rate and a fast respiration.

Greig (1997) investigates interaction of anxiety and warm up I on
learning motor task. He found that for high anxiety groups, performance was significantly better under the no warm conditions, warm up feet the performance of both high and low anxiety group significantly.

In the literature on Anxiety and motor behaviour Rainer (1997) concluded that generally that there is a positive relationship between anxiety level and speed of performance as long is relationship between anxiety. Level and speed of performance as long as accuracy is not a motor factor.

Okendine (1998) hypothesis that there is a differential officinal. Level of arousal for various spats. Since high arousal states expedite motor. Responding which demands strength, endurance and sapient, Oxendie place distance running, which requires great strength and endurance and marketing less find muscle, high on his anxiety continual.

Buring Competition, The sports men are by and large fearful to some degree which eventually affects their performance. This is natural phenomenon. No human being is free from fear and anxiety. In the stressful setting provided by competitive sports is useful to observe a player who either is unable to act because of fear. The world 'fear' here refers to rational appraisal of real threatening situation and the term anxiety nature an abnormal apprehension of such a situation.

Agya Hi (1998) compare the competitive anxiety traits of the tap level Indian athletes and Hockey players. He found that track and field players had male anxiety traits as compared to the Hackey players whether male or females.

Shorya (1997) compared anxiety level of high and low physical fitness gramps and found that they did not differ on sports competition anxiety from each others.
Hussain (1998) attempted to compare high and Low anxiety greats on the basis of motor fitness. He concluded. That bigs studying in VII and VIII class of high and low anxiety level group did not differ in motor fitness significantly. Related findings of competitive anxiety can be summarized as follows.

I suggest that anxiety can be experienced at any point during the completion process that a person perceives including.

A. Prior to competition, if the person anticipated an inadequate performance.

B. During competition, of the person perceive the on going performance to be inadequate and therefore, anticipates future failure.

Mann (1988) Conduction a study to assers the competitive anxiety level of team spats:. Font Ball, basket ball and valley ball, un male Punjab hmveridf blues. F.B. 14 B.B .19 and R.B. 16 were investigated for this study. She difference in level of competitive anxiety in this main situations. Threat, Physical/defeat threat and aspiration threat and four made of responses, visceral, Muscular cognitive and Anger of foot ball, basket Ball, and valley ball groups were compared. Criterion measures used for the study was Hann's Scale of competitive anxiety based on Ecndler's Model, Person X Situation X male of response. The date were statistically analyses to find out. He inter group differences. Analysis of variances techniques was applied. Fort balers were found higher on all the three situations in competition to other groups in he first three main made of response. Visceral muscular and congestive difference were found statistically significant. How, ever in hi fourth made of response i.e. anger, Foxt Baller were found higher than other group. The
difference is statistically significant.

Agmer Supi et. al. (1980) situation the anxiety differences between male and female hand Ball players as-inter university level on the Basis of sports confections Anxiety test (SCAJ) Amora was worked out to find out- differences. The differences of completive anxiety between males and females come out to be statistical' significant at i.s. level.

Raynida Singh (1989) compared is champion and not, champion male wrestlers as-national Level and found that male wrestlers had found highest within sportsmen group of basket Ball following by Hockey, football, athletic, Non sports men and lowest in cricket.

Harson and Johnson (1990) fond a close relationship between collage foot Ball players level of anxiety prior to a game and their actual game performance. They concluded that the higher the level of arousal (anxiety) The higher the quality of performance.

The degree of threat in confutative setting is the orised to be function of the uncertainty of the out come and the impedance of the out come. Uncertainty decencies as the probability of the success and uncertainty decreased as the probability of the success deviates from the intermediate range. Rascopr indicates that anxiety improves motor performance on simple tasks but impassed complex motor behaviours. Crathey (1993). Anxiety has a temporal relationship to performance. The level of anxiety evidenced prior to performance may be different from arousal during performance following a stressful situation about change in reparative anxiety are often recorded. In general anxiety level increases prior to a danger less situation unstill. They become relatively light. Just before it is encounters. During performance anxiety is often lessened. Science the individual must-concend male. On his action than on his internalized fears.
STUDIES ON ANXIETY

Hall and Lindzay (1995) expressed that anxiety is the experience of tension, stress and pressure that results from real or imagining threats to one's security, fame and recognition. It reduces the efficiency of the individual in satisfying his needs, disturbs interpersonal relations and produces confusion in thinking and physical working which may ultimately lead to serious mental, physiological and psychological, disturbances or illness, like neurosis and in severe cases psychosis, and affect physical performance and also some values adversely which the individual holds essential to his existence as a stable and balanced personality.

Liebert and Morris (1997) developed worry emotionality inventory and found that both cognitive worry and somatic anxiety have different effects on intelligence and motor performance whereas somatic anxiety is related to performance only when cognitive worry is low.

Saini (1999) conducted a study on psycho-social factors of champion and non-champion hockey players. She found that non-champion players had significantly more neurotic tendencies and maladjustment as compared to the champion of various sports activities.

Lokesh (1998) examined the anxiety prevalent among track and field athletes and their treatment through self constructed questionnaire and stress reduction training model. He found that track and field athletes participating for competition in track events had more Anxiety as compared to track and field athletes who participated in track events for recreation.

Johnston and McCabe (2003) studied the efficiency of approach and avoidance strategies for coping with stress experienced during sports
performance of under-graduate female students. The results showed that the use of appropriate strategy enhanced perceived capability and improved performance. Evidence was also found to support the concept of stress as an appraised imbalance between perceived demand and perceived capability.

Bali (2004) conducted a study on sports orientation, behavioural coping and emotional coping among winners and non-winners of intervarsity competitions in contact and non-contact games. She concluded that male-intervarsity athletes are better than athletes in sports orientation and win-orientation. Again they have better emotional coping ability.

Relationship between somatic anxiety and performance and cognitive worry and performance was studied by Libert, and Morries Morris in the year (1967). In their findings they concluded that the psychological component s of anxiety. Consists of cognitive worry and somatic anxiety as sub-components. They further postulated that cognitive worry and somatic anxiety change differently prior to and during performance evaluation. Specifically, somatic anxiety increases prior to evaluation but cognitive worry changes only when performance actually changes. Furthermore, cognitive worry was consistently inversely related to performance but somatic anxiety was related to performance only when cognitive worry was low. These findings provide support for a multi-dimensional conceptualization of state anxiety.

Johnson and Hutton (1995) investigated changes in the neurotic signs of wrestlers. They highlighted that, wrestlers displayed increased 'neurotic signs' right before the match and then returned to normal level the day after the contest. They found that this tendency of the wrestlers
had detrimental effect on their performance.

Ogilivie and Tutko (1987) conducted a study to find out distinctions in personality characteristics like neuroticism and avoidance tendencies due to stress and fear of losing game between champion athletes and average athletes, they found that former showed more resistance to competition stress and fear than the later. Therefore, champion athletes, it was found, have less behavioural disorders in comparison with average athletes.

Liebert and Morris (1977) found out the significant relationship between somatic anxiety and performance and cognitive worry and performance. They emphasized that the psychological component of anxiety consists of cognitive worry and somatic anxiety as sub-components. They further postulated that cognitive worry and somatic anxiety change differently prior to and during performance evaluation. Specifically, somatic anxiety increases prior to evaluation but cognitive worry changes only when performance actually changes. Furthermore, cognitive worry was consistently inversely related to performance but somatic anxiety was related to performance only when cognitive worry was low. These findings provide support for a multi-dimension conceptualization of state anxiety.

Duthie and Roberts (1998) tested attainments in a complex motor learning task for 55 male university undergraduates grouped into three categories of abnormality in behaviour. Taylor’s scale was used to categorize anxiety into low, average and high level. No significant differences were reported between the groups for either learning or final performance on the motor task.

Morgan (2000) while emphasizing the important part played by
Sports psychology, state that, "as training programmes and competitions became more intense and higher, especially in case of super sportsman the role of psychology becomes even more vital.

According to Schollander (1971), in Olympic competition a race is won in mind winning is 20 percent physical and 80 percent mental."

Sardari (2003) studied the relationship of performance in Basketball game with personality characteristics of introversion extraversion and neuroticism-normal and intelligence level of the players. A group of 100 students between 14-16 years of age studying in various higher secondary schools at Patiala and participating in Basketball and free from physical and mental disturbance were randomly selected and used as subject in the investigation. It was noticed that subjects were differentiated in personality groups on the basis of the scores obtained by the subjects on Maudsley Personality Inventory (M.P.I) of Eysenck and General Mental Ability test of Jalota. It was found that subject low on extroversion and high on neuroticism scales and high on intelligence level were significantly better in performance as compared to subjects high on extroversion and low on neuroticism scales and low on intelligence level. It was concluded that the neurotic subjects had significantly low achievements in basketball.

According to Martens and Gill (2006) several sources like interpersonal and situational stress of competition stress and state anxiety experiences prior to, during and following competition have been identified for male and female young athletes participation in individual and team sports activities. Specifically, low personal performance expectancies, worries about failing, high dispositional anxiety and also high pre-competition stress, lead to poor performance and increases
stress experienced during competition.

Scanlan (2007) found out the impact of successful outcomes on the development of threat and fear of failure of potential negative evaluation. It was found that failure outcomes maximized threat and fear. His investigation of attribution of high versus low trait relative to success failures' on a competitive motor maze works (task) clearly indicated that success failure was an important factor affecting the perception of threat and fear. It was also added that under failure situations it developed lack of self-confidence and avoidance tendency and hence minimum performance.

Gerson and Dashaies (2008) conducted a study to find out relationship between competitive situations due to threat and fear of failure and performance as predators of pre-competitive feelings. The results yielded a significant relationship. Pre-competitive anxiety had detrimental effect on performance due to lack of self-confidence, fear and threat of the situations.

Arshad Mohd. (2008) through a study on track and field athletes found that the mean performance of the high anxious groups differed significantly than those of low anxious subjects was better than low anxious subjects. But he added that pre-competitive anxiety of track and field athletes had negative influence on competitive performance, though difference did not emerge significantly.

Hanin (2009) conducted the study, in the area of competitive sports, the relationship of performance to state-trait anxiety. He pointed out that stressful threat and fear of failure setting provided by competitive sports developed behavioural disorders like neurotic tendency, which further adversely affects performance of the athletes.
Landars and Schmidt (2007) theorized that increase in state anxiety cause attentional disruptions of biases in the information the performer receives from the environment. Thus, they attempted to explain performance decrements that occur under condition of elevated anxiety on the basis of selection errors that occur prior to information processing. They also added that elevated state anxiety serves to bias or distort environmentally based information which led to the development of behavioural disorders and as such affects performance.

Matveyev (2006) "Sports became highly competitive. As the level of competition increased, the role played by psychology of sports goes an increasing."

Hall and Purvis (2007) investigated the effects of both trait and state anxiety on competitive bowling of the athletes. Results showed that (i) lower pre-competition averages were significantly related to high anxiety state scores; (ii) bowlers exhibiting higher neurotic tendencies prior to competition performance significantly were poorer in performance during the tournament and that high trait bowlers scored significantly higher on anxiety state before competition; (iii) high anxiety trait bowlers had lower averages at the beginning of competition.

Morris et al (2006) developed multi-dimensional theory test fear hypothesizing that the differential nature and patterns of change of these components of nervousness should result in cognitive anxiety, imparting performance more often and more strongly than does somatic anxiety. They further hypothesize that cognitive anxiety should be a more powerful mediator of ongoing performance. They opined that expectations of success may change at any time during competition. Research in numerous disciplines has demonstrated powerful impact that
expectations can have on performance. Cognitive anxiety arises whenever expectations of success become negative, thus, accounting for worries athletes experienced for several days prior to competition. They were of the opinion that somatic anxiety usually demonstrates a characteristics pattern of change prior to competition. In the athletes, it is found, betray increasing rise of anxiety by degree as competition time draws near, which reaches its peak as the competition begins and then it decreases rapidly after the competition.

Potter and Lorentzen (2007) confirmed the previous findings concerning the relationship between competitive trait anxiety and pre-game state-anxiety. They concluded that state anxiety increased as the event comes close in time and developed tension, depression and hypersensitive if one failed adjust, with low performance in the game he developed behavioural disorders.

Soustroem and Bernardo (2007) studied intra individual pre-game state anxiety with basketball performance. The state anxiety they expressed was in term of their fear of loosing the game which eventually leads to frustration and aggression. They found state anxiety affecting both performance total point and composite game significantly. Although anxiety trait predicted absolute anxiety state level extremely well, it failed to achieve a significant relationship with performance. They added that high anxiety state scores were found to be associated with poorest performance in all the three trait groups due to neurotic behaviour imbalance.

In one of the studies conducted by Giri on non-athletes, mediocre and position winner gymnasts, it was found that non athletes did not differ from the mediocre, the position winner gymnasts on personality
types. But he found significant differences between position winner and mediocre gymnasts in personality types. Mediocre gymnasts had more tendencies towards neuroticism.

Ahuja (2006) in his research investigation pointed out that stress during competition developed various physiological and physical changes through psychological effects of sports competition in athletes. These changes become obstacles in park performance of the athletes and ultimately deteriorated their performance.

Martens et al (1983) in one of their studies found that cognitive worry was negatively related to self-confidence. Thus, trial sport confidence and competitive orientations influenced sport-confidence and self-efficiency. It was further concluded that cognitive worry was inversely related to both state sport-confidence and self-efficiency. Finally, research and anecdotal evidence suggested that both self-confidence and worry influenced performance. Self-confidence enhanced performance whereas cognitive worry impaired it.

Krueger (2004) says that, "The Soviet proved that with more psychological training the sports group achieved the best performance."

Browne and Mahoney (2005) found the effect of anxiety arousal on performance of the athletes. They pointed out that a curvilinear relation existed between arousal and performance as such performance would be optimal under a moderate level of arousal, and arousal levels that are either very low or very performance. Stress experienced during performance was often linked to level of arousal, with both cognitive and somatic anxiety being its prominent features. It was also experienced that the muscular tension due to bracing of muscular tension due to bracing of muscular tensions may lead to impaired physical performance skills.
Smith (2008) pointed out the relationship of stress with performance in athletes. He emphasized that stress was virtually inherent, in competitive sport. It included responding to external pressures, such as meeting the expectations of other and unpleasant feelings related to fulfilling personal goals, anxiety about performance, success and failure and the importance of winning. When these sources of stress were of long duration they were labeled as chronic. Chronic stress could result in burn out, demotivation, poor sports performance and the eventual withdrawal of the athlete from competitive sport. He also found out that stressors viz. unpleasant verbal input from the coach, opponents, the crowd, or team mates, found cheating by an opponents, making a physical error, disagreement with an official's decision and experiencing pain and injury and low performance, could acquire an acute level of intensity and finally result in adverse impact on performance of the athletes.

David et al (2007) conducted a study on competitive anxiety. The Sport Competition Anxiety Test (SCAT) was used to identify athletes with high and low (upper and lower of percent) competitive trait anxiety (CTA) from among 60 male and 60 female junior high scholars. High CTA athletes reported more frequent evaluation and performance worries and more anticipated negative feelings when playing poorly than low CTA. These groups did not differ in perceived importance of success in sport, in satisfaction with sport experiences, or perceptions of their success failure in sport. Males and females differed significantly in only team performance expectations. Results also provide support for the hypothesized relationship of fear of failure and fear of evaluation in Competitive Trait Anxiety.
Weinberg, Bruya, Jackson and Garland (2007) conducted two experiments using physical activity classes. The most, important finding from these two experiments was that assigning performance goals that are far beyond the reach of individuals can undermine motivation and increase fear level due to repeated failures which results in the development of behavioural disorders and hence, decrease in performance.

Rainey and Cunningham (2008) found relationship between behavioural disorders and performance of athletes. Their finding was that various behavioural disorders, especially compared to the champions of various sports activities.

Lokesh (2009) examined the behavioural disorders prevalent among Athletes and their treatment though sell constructed, stress reduction training model. He found that Athletes participating for competition in track events had more behavioural disorders as compared to athletes who participate in track events for recreation.

Johnston and McCabe (2009) studied the efficiency of approach and avoidance strategies for coping with stress experienced during sports performance of under-graduate female students. The results showed that the use of appropriate strategy enhanced perceived capability and improved performance. Evidence was also found to support the concept of stress as an appraised imbalance between perceived demand and perceived capability.

Bali (2010) conducted a study on sports orientation, behavioural coping and emotional coping among winners and non-winners and intervarsity competitions in contact and non-contract games. She concluded that male-intervarsity athletes are better than female athletes
in sports orientation and win-orientation. Again they have better emotional coping ability.


Ravneet (2005) Conducted study on 120 sportsmen/women of post graduation Kurukshetra University. The took males and females belonging to Judo, Gymnastics, Cricket, Badminton and Basketball games. She found significant difference in sports women and non-sports women where sports women are more aggressive.

Cennor and Webb (2007) Compared the personality traits of four groups of their collegiate female athletic competitors and one group on non-competitive students by administering 16 PF CattelFs personality factors of intelligence radicalism, self sufficiency and control.

Spink (1996) examined the cognitive and behavioural strategies of male and female swimmers in training and competition. The data collected by the questionnaire was analyzed by using t-test. The factors which best distinguished between the two groups included use of imaginary thinking about the competition, hours in other training and thinking about the mistakes. Specifically, females as compared to the males were reported to be using more imaginary thought more about the competition and spend more hours in other types of training. Males thought more about mistakes made earlier in the competition than the females.

Hall et. al. (1996) It is true that personality components sports in cooperation with the woman's sports foundation, integrating this work with sports psychology has given him a unique prospective, (12 Dec. 2002)

It is also observed that severe stress minded with high level of fear anger and anxiety leads not to impaired performance but to disorganized behaviour also and lowers the adaptive efficiency Sklar and Anisman (2007), they have also reported that severe and Sustained stress or anxiety on any level leads to a serious reduction minor are adaptive capacity and competence of the organism and with effect there performance reaches below the level of capabilities and potentialities of the individual. Tension is the normal reaction to anxiety and in turn anxiety is often a normal reaction to danger or fear situations, which are normally in sports field. For some prepare dimension and anxiety may be source of Power which can enable than to over come many of their problems and improve performance. But normally, the biochemical changes relates to tension, may resulting development mental disease of a neurotic nature.

CONCLUSION OF THE STUDIES REVIEWED

In conclusion, we can say that in the field of sports participants experience much anxiety due to competitive situations, fear injury and opponents. Such conditions of anxiety also create maladefitive behaviour patterns. Normally Individual suffering from anxiety live in relatively constant scale of tension, wrong and uneasiness, Usually they have difficulty in concentrating and making decision. Commonly they complain of muscular tension, chromic Mild diarrhea, frequency her nature and steep disturbance etc. They perspective profusely and their plans are often clumsy they show cardiovascular changes. Such as
elevated Blocks Prevents and increased pulse rate. They experience breath lessens and heart palpitations for no appear. They generally remain self-necessary ad discouraged and due to all these facts their performance are much below their capacities, potentialities and normal performance in is usual conditions.

In the light of above facts which are found in the review of literature that much work has been done on this subject the advance country's. But here in India a very less work been done on this important subject. Psychological hurdles create problem in the mind of sportsman, which ultimate affect the performance. On the guidance of above studies facts significance of Anxiety on sportswoman very much clear. Being a sportswoman and teacher the pre research worker tries to contribute something for her profession and sportsperson. That is why the investigator undertake present research work in hand with this background.

**Studies on Adjustment**

The performance is sports is affected not merely by his physical technical and tactical qualities but also by his psychological considerations. It will depend to a large extent on his personality structure, how much is he motivated and how much emotional control and adjustment he made and possessed: Where fore, in order to explain and analyze man's interest and competitive behaviour in spate. There are so many socio-physiological factors like attitude, personality characteristics, audience or spectator's group influence, intelligence, socio-economical back grand anxiety achievement and adjustment etc; which influence the participation in completive sports:- However there are some socio Psychological factors like fear or facing and handling
opponent, fear of lasing game fear of injury, over competitive anxiety stresses depression, shyness and negativism, etc and of these Psychological make up and handing of the participant is not properly and timely his adjustment process is adversity affected. As a result he may fall prey to the development of behavioural imbalances. Thus a great need of adjustment with environment give balanced behaviour, self awareness and self confidence become an important factor in life. Confidence become an important factor in life. Specially in the field of spats and physical education to face many types of unaccounted stressful situations like conflicts, pressures, injury and complexes. The situation become difficult to cope with which forces the individual to reduce their performance much below to their capability so adjustment is a main factor of the sports person with environment situation to adjust than self.

Tufko and Tosi (1980) comment that psychological tendencies can help or hinder our adjustment to performance, depending on how much adjustment to performance, depending on how much we adjust Wein (1981) contents that adjustment factors can decisively affect, either way, the performance of individual players or while term During a game each player must reach the decisions under conditions to adjustment and to avoid stress and time pressure Vallerand (1983) said that good adjustment of sports person in competitive sports can give better performance while increasing self awareness, self confidences and group activeness etc.

**REVIEW RELATED TO ADJUSTMENT AND ADJUSTMENT IN WOMEN SPORT**

The modern physical educators and coaches realised that the development of personality and the achievement of desirable social, emotional and personal adjustments have been major objectives of
physical education and games programmes. Some of the studies show that athletes participating in various activities of Physical Education and games or sports in general depict unique type of adjustment. Available research evidence to this effect is briefly examined in the following pages.

Kushlen and Lees (1939) designed a study to determine the relationship of the social acceptability with participation in games among boys. They found that to be active in games was important for social acceptability (recognition).

Carter and Shanon (1946) found high school athletes were socially adjusted than non-athletes.

Sperling (1948) conducted a study on "The relationship between personality adjustment and achievement in physical education activities". This study was undertaken in order to furnish experimental data which might clarify the issue and enable one to say with greater assurance that exists at present that athletic achievement is or is not associated with more favourable personality development.

Sperling (1948) compared non athletes to varsity and intramural athletes and found the athletes scored higher in personality adjustments, ascendance, and extroversion and lower in aesthetic appreciation and theoretical orientation. He also found significant differences in social adjustments in favour of athletes.

Alexandra (1956) obtained data on leadership in adolescence and compared them to personality adjustment. She found that leaders were significantly better adjusted then non-leaders.

Powell (1957) found high and significant relationship among adjustment in various field of life and health practices to performance of
physical education activities.

Rurich and McLece (1959) studied twenty third grade children who exhibited extreme level of achievement on motor proficiency tests. He found that third grade children who attained a high level of motor proficiency tended to be more frequently well adjusted in school environment and personal relationship.

Brownell et al. (196ft) maintain that physical education makes a contribution to general adjustment and well being that can be obtained from no other source. One of the earlier investigations to demonstrate that athletes differ from non-athletes on selected psychological traits was Heunser (1965). By using the 16 RF Questionnaire, he found athletes to be more emotionally stable (Factor O), dominant (Factor E+), Venturesome (Factor H+) and self confident (Factor O-) than the non-athletes.

Signorella (1963) in a study of social adjustment and athletic participation found that participants are well socially adjusted as compared to non-participants. Ondrus (1963) used sociometric techniques and analysed that effect of football activities on interpersonal relationship He reported that participation inter-personal (social) relationship / social adjustment, He added that participants had higher social status than boys who were not able to participate. William (19IB) found that the process of social integration in college football squad was positive (favourable) and continued throughout all the three periods of the football season.

Biddulph (1964) conducted a study on "Athletic achievement and the personal and social adjustment of ranking high school boys" and concluded that students ranking high in athletic achievement
demonstrated a significantly greater degree of personal and social adjustment than the students ranking low in the athletic achievement; Because of this significant relationship it was concluded that it is important for develop more ability.

It seemed desirable to consider athletic achievement as represented in the typical high school boys rather then in trained, experienced athletes because of t^\textsuperscript{\textregistered} varied and complex factors which seems to greatly influence the personal and social adjustment to the trained athlete, experienced as he is in competitive play. Unnatural popularity, which may athlete enjoy, is often a distinguishing influence rather than a stabilizing influence upon their personalities.

Laplace (1965) using MMPI reported significant differences between major and minor league baseball players on personality traits like anxiety, self analysis, self criticism and social adjustment He found that major league baseball players were socially well adjusted than minor league players. Sehmonn (1956) studied the emotional health adjustment of basket ball players and reported that boys participating in little league competitions maintained their emotional health adjustment better than the non-participants.

Seymour (1967) designed a comparative study of certain behaviour characteristics of participants and non-participants boys little league baseball. He found that participants in baseball tended to be more frequently well adjusted in school and personal relationship as compared to non-participants.

Skubic (1969) conducted studies of little league and middle league baseball on school population and found no conclusive evidence that participation in the games was harmful, rather than useful for all
purposes and development of certain desirable adjustment like social acceptance.

Elvera (1971) used various types of peer status evaluations and teacher judgements were utilized as criteria of social adjustment. In general, the results showed a relationship between these criterion and physique type, body size, muscular strength, motor performance and athletic ability.

Cowell (1980) studied the relationship of social students to physical ability. He used self-constructed rating scale to measure adjustment ratings either by teacher of by classmates were positively and significantly related to physical education ability.

Cowell and Ismail (1982) have observed that the boys who do well in physical ability tests are likely to have leadership potentialities to be accepted for close personal contacts by their associates and to be well-adjusted socially.

Clarke and Clarke (1981) designed a study to find out the social status as related to the maturity. Structural and strength characteristics of students. They employed both techniques sociometric questionnaires and inventories to find social status and adjustment. They found positive relationships between peer status adjustment and body sizes, and peer status adjustment and muscular strength.

Cowell and Ismail (1984) studied interrelationships between personal distance (degree of personal acceptance), motor fitness and athletic aptitude using 83 boys in the 10 to 20 years of age range. The relationship of athletic aptitude to leadership was studied in the same group. Another group of 75 boys of Junior high school age was used to study the interrelationships between social adjustment, motor fitness and
athletic aptitude. Instead another group of 45 freshmen varsity football squad members, the relation of personal distance sports to football ability as judged on a man to man rating bases on some items, was studied. All the relationships were found to be positive, moderate and significant at the .01 level of confidence.

Coleman et al. (1985) in a study of relationship between motor performance and social adjustment among boys experiencing serious learning difficulties found a strong relationship between motor performance and social adjustment of the subjects. Robert (1984) examined the physical fitness and adjustment of students on the college campus. By administering AAPHER Physical fitness test and Washburne social adjustment inventory. He found appreciable differences in the scores of football and basketball group on Washburne social adjustment inventory. Gottliil and Warner (1986) using 16 P.F. compared 340 athletes cadets and 116 non-athletes after they had entered 4.5 military academy and before they had graduated. Athletes were found more social, group dependent, sophisticated and conservative than non-athletes. But even after the regular practice of four years in athletic participation, the non-athletes did not change in personality structure. It appears that these tracts may lead to better adjustment in various spheres. Rushall (1967) administered Cattell's 16 PF Questionnaire to athletes and non-athletes; by employing t-test he found that sportsmen were emotionally more stable, matured and more socially adjusted than the non-sportsmen.

Ogilvie (1989) confirmed Cooper's conclusions besides pointing out STIB other aspects of the male athletes personality. Ruth Ralph (1971) has conducted a study on "the effects of general semantics on the
personality adjustment of elementary school children." This study describes experimental projects that have evaluated the effects of general semantics may contribute to personal and social adjustment and the scientific methods of objectives evaluation should be used to investigate this.

Betty Ruth Muntz Ryygor (1992) understood a study on "a fine year follow up study comparing the school achievement and school adjustments of children retained in kindergarden and children placed in a transition class," and the results of the study suggest that retention in kindergarden was effective in ameliorating learning deficiencies to the point where the retained children were able to make satisfactory progress in school achievement and school adjustment through the third grade.

Mehta and Velayudhan (1994) of Baroda, Dept of Child Development have summarized the studies made on the department on personal and emotional adjustments and on self concept, achievement motivation and academic achievement of adolescents. With respect to monarchal and problems of adjustment, the studies show that the monarchal age does not have any impact on the total adjustments problems and anxiety scores.

Edwards (1995) concluded that core value of the sports is that individual achievements and satisfaction through competition in sports activities, which help the individuals/be adjusted in various fields of life.

Bhullar (1988) compared the personality adjustment of sportmen and non-sportmen as measured by Bell's adjustment inventory. It was concluded that sportmen and non-sportmen show marked difference on adjustment

Subhash (1988) conducted a study on 50 students participating in
800 meters race and found that better performance of participants in 800 mt. races brings health, social and emotional adjustment. To measure adjustment in various fields of life, the Bell's adjustment inventory was used, and the performance in 800 mt. race was recorded while the subjects were participating in college and university's athletic functions. Supreitzer and Snyder (1975) sought to identify the social definitions of sports in the context of value orientations by asking people what they felt were the functions are consequences of sports. They found that most people defined sport as having positive functions for both society and the individual participants. It means sports helps in social and personal adjustment of a participant in physical education and games. Singh (1975) conducted a study on 50 male participants in 5000 metres race and found that better the social adjustment the better the performance in 5000 metres race. He concluded that social adjustment is the significant detriment of the running performance in 5000 mts. race. Jeffery (1991) conducted a study to investigate possible relationship between prior-scholastic athletic process and current measure of self concept. Investigations revealed little in way of significant differences (.05 level) between former superior, average and non-athletes in terms of currently measurable levels of self-concept and life adjustment.

Rana (1996) administered "16 P.F. questionnaire to sportsmen to sportsmen of Jiwaji University, Gwalior and concluded that sportsmen differed from non-sportsmen in personality, characteristics of emotional stability and realism about life, cheerfulness and frankness, tendermindedness and had greater control over emotions and greater regards for self respect and social reputation than the others. Similar findings have been noticed by Dalip K. Dureha (1996) who compared the personality characteristics of sportsmen and non-sportsmen. He found
that sportsmen and non-sportsmen differed in their personality characteristics on the factors of emotional stability and realism about life, cheerfulness and frankness, tender mindedness and practicability and greater control over emotions and greater regards for self respect and social reputations. On the contrary, Calirner and Gotthell (2000) found no evidence to support the view that college athletes significantly influenced personality structure.

Das (2001) did a study in which performance in track events was related to school adjustments Bhagia's school adjustment inventory was used on 400 school athletes. He found positive relationship between the failure and high performers. High performers are well adjusted athletes.

Sharma and Shukla (2002) conducted a study on athletes and non athletes by using Cattail's (1963) high school personality questionnaire (H.S.RQ). He found that athletes in various sports specialties tend to be outgoing, socially confident, emotionally stable, happy-go-lucky, conscientious (rules bound) and venturesome. self-reliant, vigorous, confident, self sufficient, controlled and relaxed. On the other hand, the non-athletes are reserved, less intelligent, effected by feelings of weak, super-ego, shy, tenderminded, suspicious, doubling, indiscipline and tense. The above findings have been supported by Bidulph (1954), Werner et. al. (1966), Singer (1967), Kane (1968), Bhushan (1978) and Sharma and Shukla (1979).

Bhatti (1997) conducted a study on 290 college athletes and non-athletes by administering Bell's Adjustment Inventory and found that non-athletes were significantly better than athletes in home adjustment. There could not be found any difference in their health adjustment, social adjustment and emotional adjustment.
Nasib Singh (1988) conducted a study by administering Sinha and Singh Adjustment inventory for college students (S.S./AICS) to compare the individual and team athletes on selected psychological variables and concluded that individual and team athletes have not been found to be significantly different from one another on various areas of adjustment except educational adjustment, where the difference between the two has not been found to be significant. Marked inter sports differences have been found on all areas of adjustment. Basketball, boxing and handball groups have registered significantly better abound adjustment whereas track and field and hockey groups being poor on adjustment have differed considerably from other sports groups. Successful athletes differed significantly from unsuccessful athletes on all areas of adjustment.

Panda and Biswas (1999) conducted a study on 50 high achieving and 50 low achieving football players, graduate male of Orissa. They administered Maudsley personality Inventory by Eysenck (1964) and Psychoticism Scale by Eysenck and Eysenck (1968) in Oriya version. They found significance of difference between all factors personality adjustment of High and low achieving football players.

Sharma (2000) conducted a study on 525 male intervarsity and Inter-college participants of Boxing, football Gymnastics, Hockey, Volleyball and wrestling by administering Sinha & Singh Adjustment Inventory for College students. The results realistic, show that:

1. Home adjustment: Football and Hockey players have better home adjustment than wrestling and gymnastics players and Inter university positioners are better than the participants of Inter College level.
2. Health adjustment: Athletes, Boxers, football, Hockey and Volleyball players have better health adjustment as compared to wrestlers and gymnastics players.

3. Social adjustment: Inter College participants have highest level of Social adjustment while Inter college participants have least.

4. Emotional adjustment: The position holders of Inventory and participants of Inter College have better emotional adjustment than the losers of intervarsity.

5. Educational adjustment: Athletes, Boxers, footballers, gymnasts and hockey players have better educational adjustment than the wrestlers.

Sharma (2003) conducted study on 240 male team players i.e. Basketball, football, Hockey, and handball. He observed relationship between the performance of dominant groups of football players with health adjustment. Hockey players with emotional and total adjustment whereas no relationship between the performance of submit group of all the four sports with any of the adjustment variables.

ADJUSTMENT IN SPORTS OF WOMEN

Ackerson (1941) made a statistical study of the 5000 children examined at the Illinois Institute for Juvenile Research. He found that the adjustment problem were more frequent among boys than among girls and that frequencies increased for both up to about the age of twelve years. He divided adjustment problems into personality and conduct problems.

Webb (1979) reported individual women athletes to be more introvert, self-absorbed, independent-minded and self-assured than team
sports women. The team sports women were neither self-absorbed nor introverted. The tended to be realistic, emotionally disciplined, steady and practical. Socially both groups tended to be more cool.

Koening (1989) in his study on high school girls Basketball players found that personality differences existed between athletes and non-athletes with respect to sociability, group orientation and emotional control. Both university team members and intramural players had higher self-concept than non-participants with respect to sportsmanship, degree of family and family influence.

Mary (1990) measured physical fitness by AAPHER youth fitness test, attitude towards physical education by attitude inventory form A and personal social adjustment through California test of personality second form AA. It was concluded that there was significant relationships among the factors when the tests were conducted on high school girls. It is further added that socio-economic status has relations with adjustment.

Buck (1979) selected Pollock Health Behaviour inventory test to measure health, behaviour of high school seniors (boys and girls) die main findings were

1. other things being equal, a person who is well adjusted tends to have good health behaviour;
2. other things being equal, a person with good health, behaviour will tend to be well adjusted;
3. the relatively high relationship between low health, behaviour and low total adjustment and relatively high correlation between personal and social adjustment suggested that the two types of adjustments could be measured by a single test. Female students
scored higher than male students on every test of health, behaviour and adjustment.

Chadwicks (2002) did investigation on female athletes and characterized them as tough minded (factor I-) whereas athletes in Pestonjee's et al's study were found to be more outgoing (factor A+), serene (factor O-) and socially precise (factor Q+) than non-athletes. By using the cattell's 16 personality factor questionnaire, Mushier (2002) and Ruseh (2002) however, found adult female athletes to be more reserve (factor A-) and tough minded (factor 1-) than the non-athletes. In addition to these factor, athletes in Mushier's study were characterized as more intelligent (factor B+), aggressive (factor E+) and happy go lucky (factor F+) than the non-athletes.

Antonelli and Mascellani (2003) carried out a study on 351 top Italian athletes using the Bell's adjustment inventory adult form. They found that the male athletes had better adjustment than the female ones. Sports where participants have good adjustment are: athletic, volleyball, sailing and fencing. Inferior adjustment is found in cycling, swimming, rowing and gymnastics.

Dhillon (2004) conducted a study on 800 sportsmen, sportswomen and non-sportsmen, non-sportswomen to know their school adjustment. To measure school adjustment Bhagia's school adjustment inventory was used. She found that sportsmen/women were significantly better adjusted as compared to non-sportsmen/women.

Evans and Quarterman and Maxceiner (1983) conducted a study on successful female Basketball players and unsuccessful female Basketball players or successful volleyball and unsuccessful volleyball players respectively. They found that successful female Basketball players were
more trusting than the unsuccessful players and successful volleyball players were more emotionally stable than the lower level players.

Amra (2006) conducted a study on sports girls and non-sports girls by using Sinha and Singh (1984) adjustment Questionnaire (AISS) for school children. She found that sports girls belonging to rural and urban areas were better in all variables of adjustment i.e. emotional, social and educational than non-sports girls.

Ohri and Dalip (2006) conducted study on 50 tribal and 50 non-tribal women by administrating Bells adjustment inventory (BAI) and Bems sex-role inventory (BSRI). They found that due to the well defined feminine roles the tribal women shows better home and health adjustment than their non-tribal counterparts. The non-tribal women, on the other hand face the problem of role-conflict, role-overload and physical exhaustion which account for their poor health adjustment. The non-tribal women also have to deemphasize some aspects of their role in the family to emphasize other roles and this leads for their poor home adjustment in comparison to their tribal counterparts who have still not rejected their natural identities in the community.

**REVIEW ON COMPARATIVE STUDY OF ADJUSTMENT AND ANXIETY**

Peterson, Weber and Trousdale (1967) conducted a study on (1) 38 women athletes in individual group from 1964 U.S. Olympic teams of swimming, diving, riding, fencing, canoeing, gymnastics and track and field. (2) 59 women athletes in team sports group from 1964 U.S. Olympic teams and top 10, 1964 women AAU basketball teams. They administered 16 PF questionnaire of Cattell, and Eber (1957). The results indicated that women who are engaged in individual sports were more dominant and aggressive (E) adventurous (H), sensitive (I), imaginative
(M), radical (Q1) and self-sufficient and resourceful (Q2) than women who are engaged in team sports. Individual sports athletes also appear less sophisticated (N) and less adjusted (L2).

Cooper (1989) after contrasting athletes and non-athletes describes athletes profile as more outstanding and socially confident, more outgoing and socially aggressive dominant and leading better socially adjusted, higher in prestige, social status, self confidence and competitiveness; less impulsive, less compulsive, tolerance of physical pain, having more masculine interests and less feminine ones.

The general trend in findings on personality differentials i.e. emotional stability, socially adjusted, aggressiveness, self confidence etc. between non-sports men and sportmen was supported by Cooper (1989), Kane (1988), Ogilivie (1988). On the basis of review of the available literature they concluded that although there was not a definite hierarchy, certain personality traits like emotional stability, aggressiveness, tough mindedness and self confidence went well with superior sport performance. In addition to traits, Kane also stressed lack of anxiety and drive f whereas Ogilivie asserted that conscientiousness, self-control, self-discipline, trust worthiness and low tension level should also be emphasised. Cooper's (1989) analysis of literature also revealed that athletes tended to be outgoing, socially adjusted, higher in prestige and social status, stronger competitors, less compulsive, less impulsive, having greater tolerance for pain, lower feminine interest and higher muscular ones.

Mushier (2000) and Rusch (2000) found adult female athletes to the more reserve (factor A-) and tough mind (factor 1-) than the non athletes. In addition to these factors athletes in Mushier's study were
characterized as more intelligent (factor B+), aggressive (factor E+) and happy-go-lucky (factor F+) than the non-athletes. Athletes in Rusch's study were found to be more adjustive than the non-athletes.

Agarwal & Sharma (2005) conducted study on the adjustment and aggression among wrestlers and boxers of 14-16 years age group. Through adjustment inventory of A.K.R Sinha and R.R Singh (AICS) and aggression questionnaire of G.C. Patti the results revealed that there were significant differences between the aggressive behaviour, total adjustment home, social, emotional and educational adjustment; whereas there was no significant differences found in health adjustment of boxers and wrestlers. While comparing the results, the boxers were found more aggressive and less adjustive whereas wrestlers were found less aggressive and more adjustive in total adjustment, home, social, emotional and educational adjustment but both boxers and wrestlers were found equally adjustable in health adjustment.

Widdop and Widdop (1995) reported their study conducted on women trainees to be classroom teachers and those training to be physical education teachers. The multiple discriminant analysis indicated significant differences in personality between the groups. Separate personality components revealed the student classroom teachers to be high on order, affiliation and patience and the student physical education teacher to be high on warm-heartedness, mental capacity, enthusiasm, perseverance, venturesomeness, imagination, shrewdness, self-sufficiency, self-image, exhibitions in dominance and social presence.

Pestonjee et al (1991) also used the 16 PF-Questionnaire and reported athletes to be less intelligent (Factor B-), practical (Factor M-) and group dependent (Factor Q2-) than the non-athletes. The female
athletes in Chadwick's investigation were also characterized as tough-minded (Factor I-) whereas athletes in the Pestonjee et al.'s study were found to be more outgoing (Factor A+), serene (Factor 0-) and socially-precise (Factor Q3+) than the non-athletes. By using the Cattell's 16 Personality Factor Questionnaire, Mushier (1992) and Rusch (1992) however, found adult female athletes to be more reserve (Factor A-) and tough-minded (Factor I-) than the non-athletes. In addition to these factors, athletes in Mushier's study were characterized as more intelligent (Factor B+), aggressive (Factor E+) and happy-go-lucky (Factor F+) than the non-athletes.

Sharma and Shukla (1986) conducted a study on individual athletes and team athletes by using Cattell's (1963) High School Personality Questionnaire (FISPQ). He found that athletes in various sports specialties tend to be outgoing, socially confident, emotionally stable, happy-go-lucky, conscientious (rules bound and venturesome, self-reliant, vigorous, confident, self-sufficient, controlled and relaxed. On the other hand, the non-athletes are reserved, less intelligent, affected by feelings of weak, super-ego, shy, tender-minded, suspicious, doubting, in disciplined and tense. The above findings have been supported by Bidulph (1954), Werner et al (1966), Singer (1969), Kane (1978), Bhushan (1988) and Sharma and Shukla (1979).

Jitendra Mohan, Joginder and Subina Seth (1998) conducted a study on a group of 50 Karate players to find out the sports special ability of athletes by using the Revised Adjustment Inventory (RAI), Kumar (1983), found that 40% to 46% of Karate players had very good, good and average adjustment respectively. 76%, 24% of Karate players were having, moderate and no risk tendencies respectively.
Jeffery conducted a study to investigate possible relationship between prior-scholastic athletic process and current measures of self-concept. Investigations revealed little in the way of significant differences (.05 level) between former superior, average and non-athletes in terms of currently measurable levels of self-concept and life adjustment.

(i) Co-educational classes and segregated in physical education do not differ significantly in contributing to social adjustment of college freshmen.

(ii) In the segregated classes, males and females do not differ significantly in gain made in social adjustment.

(iii) In co-educational classes, males and females do not differ significantly in gains made in social adjustment.

In one such study Robert (1964) studied the physical fitness and adjustment of students on the college campus. The t-test and frequency distribution technique were used to match the subjects. The AAHPER Physical Fitness Test and the Washburne Social Adjustment Inventory were administered to all the subjects. From the study it was concluded that (1) The effectiveness of intramural is participation on aspects of physical fitness is determined the individual's willingness to spend additional time other than le situations practising his skills. (2) Participation in an intramural programme of football and basketball did have a significant effect upon performance in the shuttle run and 50 'yards dash. (3) The differences in the scores of the two groups on the Washburne Social Adjustment Inventory were not significant at the 5% level of confidence for either testing period. The improvement noted by the test scores for both groups would indicate that many forces must be
studied in determining the needs of students to help them in their social and emotional adjustment on the college campus.

Furthermore, it will be a matter of curiosity to dig out the physiological, psychological and physical traits of women volleyball players. Since the controversy still exists among the coaches, physical education planners regarding the selection of players in India, the immense need was felt by the investigator to collect scientific information on volleyball game to ensure better performance. This has motivated the investigator to undertake the present study which will give us the psychological make up, status of physiological and physical structure of women volleyball players to find out the answer of the complex and often elusive questions which requires an insight into the role of these factors in sports performance. The following is the statement of the study undertaken.

Barics (2006) in her study the aggressive behaviour and adjustment in individual and team players in relation to there performance. In her results, she found that individual and teams events had significant independent effect on aggressive caused variation in adjustment any interaction of these verities caused verification of adjustment and than his total adjustment between team and individual even players and between winners and defeaters of both team and individual players.

Thomas Bomic (2007) Studies the relationship of motor components and anthropometric variables to the speed and velocity of Basket Ball Through. The component chooses were wriss strength, waist and strength waist and shoulder flexibility, speed movement of arm. Anthers doctoral variables have upper arm length and weight twenty five
Basket Ball players in the professor of Physical education were chosen as subject to the study. Analysis of the data showed that there is a significant Correlation between the velocity of long and hook Basket Ball passes and anthropometric variables.

**Studies on Physical Variables**

Human Physiology is a study of various processes that go on in human body. Broadly speaking physiology is the science that deals with functions the bodily organs perform. The word function mean the special work an organ has to do thus the eye is the organ of sight and stomach of digestion and lungs of breathing and heart of bloods.

Under physically factors we usually include those functions of the organisms that get affected by changes in the external environment. As sports competitions create an atmosphere of psychological pressure, various organic capacities of the body such as heart hate. Lurning cope of Board pressure etc. get affect, which in turn are likely to affect. The performance level of the incidental participants teams. An understanding as to how these factors work can help us prevent the external psychological pressures from a diversely affecting these important bodily functions.

**STUDIES ON PHYSIOLOGICAL VARIABLES**

Standacher (1963) studied school boys physically fit and unfit with respect to certain cardio-respiratory components in which blood pressure was one of the components. Twenty four subjects were selected randomly of grade twelve and were divided into two groups according to their physical ability. The subjects were made to run on a motor driven treadmill with the grade and speed increased every three minutes. Blood pressure, heart-rate, oxygen consumption were measured before, during
and after the run. It was found that there was statistically significant difference. Difference was indicated only in case of oxygen consumption during the run and total oxygen efficiency.

Tuttle (1970) conducted a study to find-out the efficiency of high school boys was shown by the pulse ratio test. The subjects were basketball and track and field athletes who were given stepping exercise on 13 inch bench for a period of one minute. The high physical efficiency group had a faster recovery. He also found that normal pulse rate of the trained individuals was materially the same as that of the untrained. He was of the opinion that trained individuals had lower initial heart rate.

Huckle (1983) compared the reaction of male junior high school athletes and non-athletes with respect to certain cardiorespiratory factors in which oxygen pulse was one of the factors but significant difference was noted except the duration of time where the athletes exhibited more endurance.

Howard (1986) on the basis of geographical, social and economic criteria selected 45 representative from city, town and village schools. A three percent random sampling was selected for enrolment lists. The astrand submaximal test of work capacity was administered to 809 urban and 108 rural students and maximal oxygen in-take predicted from a nomogra. Urban and rural males and females differed significantly where work capacity was expressed in litre/min. But not in terms of ml./kg. of body weight. The correlation between maximum oxygen uptake and work performed was .68 for both males and females. A correlation between work performed and average knee extensor strength of .51 was found in the case of males only.
Bhomik (1987) conducted a study, which was intended to compare and contrast the selected physiological parameters between Soccer and Kabaddi player. Total 30 players from soccer and kabaddi (15 each) were selected randomly from the Intercollegiate teams of Amravati University. The physiological parameters selected as criterion were blood pressure, vital capacity and resting pulse rate. The t-test was computed to find out the significance differences between the mean. It was concluded that kabaddi players were significantly superior in vital capacity, whereas soccer players were significantly superior in resting pulse rate in comparison to their counterparts. But in the case of blood pressure non significance differences were found between the two groups.

Ray (1988) made a study to compare the physical fitness of rural and urban students in Tripura. He administered the AAHPER Youth Fitness test to 60 tribal and 60 urban students studying in M.B.B. College, Agartala, their age ranged from 16 to 20 years. It was found that urban students were better in pull-ups and soft-ball throw for distance and their performance was statistically significant at .05 level of confidence. But in remaining five test items, i.e. 50 metre dash, 600 M. run and walk, sit-ups, shuttle run and standing broad jump, the performance of none of the groups were found statistically significant at .05 level of confidence.

Goon (1988) conducted a study on comparison of cardiovascular endurance of football players and endurance runners. He selected 20 men students of Lakshmibai National College of Physical Education, Gwalior of age 17 to 29 years. He administered 12-minute run/walk test to the football players and endurance runners. V ratio was calculated and it was concluded that there was no significant difference cardiovascular
endurance of football players and endurance runners.

Majumdar (1989) compared selected physiological variables and motor ability of rural and urban tribal students of Tripura. The subjects were 50 male students of tribal origin and fifty students of tribal origin residing in urban area. There was no significant difference in motor ability level as obtained from Barrow's Motor Ability Test items between rural and urban subjects. The urban tribal school students were significantly superior in physical efficiency index than rural students. There was no significant difference between rural tribles and urban tribles in body surface area and resting pulse rate and performance in standing broad jump.

Debnath (1989) purposefully studied generalized, compared and was able to contrast some selected physiological variables and body composition among Foot-ball, Kho-Kho and Table-tennis players. Total 45 intercollegiate players (15 each) of Amravati University were selected randomly. Selected physiological and body composition were measured and analysed by f-ratio test. It was concluded that Foot-ball players had significantly higher haemoglobin content, resting pulse rate and vital capacity and balance body composition in comparison to Kho-Kho and Table-tennis players.

Singh (1990) conducted a study to compare some selected physiological variables and body composition among Badminton, Table-tennis and lawn-tennis players. Total 45 male badminton, Table-tennis- and Lawn-tennis (15 from each) players were selected randomly from the state, university and intercollegiate participants. Selected physiological variables (Haemoglobin Content, resting pulse rate, blood pressure and vital capacity) and body composition (four site skin fold) were recorded,
and f-test was used to determine the mean differences among the groups. It was concluded that Badminton players had significant higher Haemoglobin content and pulse rate than that of the Table-tennis and lawn-tennis players, whereas Lawn-tennis players were significantly superior in vital capacity to their counterpart. But in Blood Pressure and composition non-significance differences were found among the group mean.

Dongre (1991) conducted a study to find out the differences and similarities between the selected physical and physiological variables of wrestling and Malkhamb players of Intercollegiate Level. Total 30 subjects (15 from each) were selected randomly from the intercollegiate tournaments of wrestling and Malkhamb of Amravati University. The data on certain physical and physiological variables were measured before training and after 21 days of training. It was observed from the statistical analysis that there were non-significant differences in all physiological and physical variables (strength, agility and endurance) except flexibility in relation to the training of Malkhamb and wrestling.

Duble (1992) investigated the relationship of selected physical fitness factors and physiological variables to fifty meters back stroke swimming performance. This study was confined to 15 male, middle school and high school students, ranging in age between 11 to 18 years from Amravati city, strength, flexibility, vital capacity and blood pressure were measured. Product moment correlation was computed to establish the relationship with the 50 meters backstroke swimming performance. On the basis of the obtained data it was concluded that strength, flexibility and vital capacity were significantly correlated with swimming performance, whereas blood pressure did not correlate
significantly with swimming.

Golden and Paul (1996) it was investigated on untrained male college students (18 to 24 years) the effect of intensity of endurance training on AT. V02 max, PWC, HR rest and HR max. 18 subjects composed three groups, two experimental and one control. The experimental groups trained for thirty minutes, two experimental and one control. The experimental groups trained for thirty minutes, three times per week for eight weeks on bicycle ergometers. The low intensity group trained at the AT and the high intensity group train at a point halfway between at V02 max. All subjects underwent an incremental bicycle exercise test before and after the training programme to identify any changes in AT, V02 max, PWC, HR rest and HR max. The AT was determined by gas exchange method. The pretest revealed a mean AT for all groups between 65 and 66% V02 max. The results indicated no significant changes in AT for any groups. A significant increase in PWC was found for both the high and low intensity groups as compared to the control (P < 0.05). No significant differences were found between any groups for any other variables. The results seem to indicate that a continuous cycle training programme at either of the two intensities will produce an increase in PWC, however will not increase AT for a group of college age males with moderate initial AT levels.

Tahamont (1998) examined the relationships that exist between somatotype, age, activity level and anaerobic power in men. Norms for anaerobic power in women were established. 100 women 18 to 35 years, were somatotyped according to the Health-Carter anthropometric somatotype. The X somatotype was 4-4-2, 20 as were somatotype a 2nd time to establish the reliability of the measurements. The performed
Margaria's step for anaerobic power, reported ink cal/min and filled out an activity level questionnaire. The somatotype components and their interactions showed sig. Correlation but the degrees of relationship were too small to be of practical values. Somatotype and activity level accounted for a sig. amount of variance in anaerobic power. It was shown that as activity level increases anaerobic power increases. The X anaerobic power value was 40.78 cal/min.

Johnson (2000) tested 38 females and 34 males SHS varsity swimmers on the Margaria Anaerobic power test assessment of anaerobic work capacity for both males and females. The cardiovascular efficiency test for girls and women for assessment of aerobic work capacity for females and the cotton division of the Ohio-step test for males. Subjects selected for the study were tested pre season and post season on aerobic and anaerobic work capacity subjects trained under the same training programme regardless of sex and were then divided according to weather they were sprinters or distance swimmers. Findings revealed that when identical training programmes are engaged in both male and female SHS swimmers, gains over the season in aerobic and anaerobic work capacity are different both between the sexes and between the distance swimming female sprinters do not differ from female distance swimmers in aerobic work capacity. Male sprinters do not differ from male distance swimmers in either aerobic or anaerobic and females increase in anaerobic work capacity through the season however, only males increase in aerobic work capacity.

Caruton et al., (2001) conducted a study of 95 fully trained football players from 14 to 16 years of age to measure the aerobic muscular power and the anaerobic muscular power. These had on the
average a maximal anaerobic muscular power significantly higher than non-athletic subjects of the same age. On the contrary the maximal aerobic power between the two groups does not differ significantly. Differences found between the players any be related to the different type of performance.

Shaver 2002 investigated the physical and physiological characteristics of 30 intercollegiate male lacrosse players. Boys composition was determined by underwater weighing with an accurate evaluation of R.V. In addition the athletes were given a work capacity test on treadmill during which time measurement were made of H.R. max, VO-2 max, and V.E. max., V.C. and T.L.C. were measured using a Collins Liters Spirometer. Muscular strength was assessed using grip, leg and back dynamometers. Present body fat ranged between 5 to 17 percent, weight between 58.6 and 82.7 kg and weight 58.6 and 82.7 kg L.B.W. between 55 and 78 kg and weight between 150 and 78 kg and height between 68.5 and 190.2 cms V.C. ranged between 2.99 and 6.501 and T.L.C. between 3.93 and 8.761 R.V. varied between 0.95 and 2.261 VO-2 max and ranged from 32.5 and 72.4 ml/kg. minute and 137.3 and 199.51 per minute (BTPS) respectively. Grip strength varied between 20 and 68 kg. back and leg strength between 122.7 and 209 kg. and between 336.3 and 645.4 kg. respectively.

Schriliber (2003) studied the effect of participation in university athletic on anaerobic fitness and relationship of somatotype to the development of anaerobic capacity. She concluded that all somatotype improved in anaerobic capacity as a result of training. High intensity work of low duration made the greatest intra group improvement in anaerobic capacity following participation in their sports and also the
endomorphs and mesomorphs had higher anaerobic capacities that other somatotype categories.

Pollock and Pate (2006) conducted this investigation to evaluate and quantity physiological difference among groups of distance runners. The subjects included 20 elite distance runners (8 marathon, 12 middle-long distance and 8 good runners). Working capacity and cardiorespiratory functions were determined by sub-maximal and maximal treadmill tests and body composition by hydrostatic weighing machine. The variables studied were maximum oxygen uptake, VO2 sub-maximal, lactic acid, sub max. lean body (P < 0.5) weight, fat weight, ANOVA sowed that the good runners differed from elite runner (P < 0.1) and the distance runners (P < 0.5). Discriminant analysis showed that both functions were significant. The first was general physiological efficiency factor that separated the good and elite runners. The second separated the elite marathon and middle long distance groups. The second function showed that the marathon runners had lower lactic acid sub max. value. The middle-long distance runners had higher VO2 max. values.

Barbara (2007) studied the effect of calisthenics on heart rate of college women and found that sprinting and squat thrust exercise were considered anaerobic and could not be performed beyond sixty seconds. The jumping jacks was considered the most useful calisthenic exercise for cardiovascular benefit more subjects could continue performing it longer while maintaining the heart rate level in the 150's suggesting a steady state.

Ozkan (2007) significant differences existed between playing positions terms of weight, 1.5 mile run, 50 yard sprint, vertical jump,
ball control wall volley, and 03 stack dribbling. No significant differences were found between any of the remaining variables significant differences were found between age groups in terms of weight, vertical jumps J-Emo agility run, and ball control. No significant differences were found between any of the remaining variables. Statistical analysis revealed no significant differences between playing experience groups on any of the experimental variables. Correlations indicated that weight, aerobic endurance, anaerobic power, and ball control skill all essential factors in high school success.

Kanungsukkasam (2008) stated that the United States had a significantly higher mean value of height than the Middle East and also had significantly higher mean values of height and weight than the East and South-east Asia. The Middle East had a significantly higher mean value of the sum of six sites of skinfold thickness than the East and South-east Asia. The Middle East had a significantly higher mean value of the body circumferences of shoulder, chest, buttock, thigh, forearm, and ankle than those of East and Southeast Asia. The Middle East had significantly higher mean values of the circumferences of shoulder, bicep, wrist, and ankle than the United States. The East and Southeast Asia had a significantly higher mean value of shoulder circumference than the United States. The United States had significantly higher mean values of the circumferences of shoulder, chest, abdomen, buttock, forearm, thigh, knee, and calf than the East and Southeast Asia. The United States had a significantly higher mean values of left and right grip strength than the Middle East and East and Southeast Asia. The United States had a significantly higher mean value of rest/work ratio than the Middle East and East. No significant differences were found in
the means of the above fitness variables between the new and old foreign students.

Blackburn (2009) investigated to observe the cardiorespiratory and ventilatory determined Anaerobic Thresholds' (Ventilatory Threshold (VT) and Respiratory Compensation Threshold (RCT)) responses to exercise following a six week conditioning programme of either arm cranking or leg-cycle to exercise. The VT and RCT values were greater for leg cycling as compared to arm cranking when expressed as absolute workloads. No significant difference was observed between arm and leg exercise measures for the VT, expressed relative to peak workload. The relative measure of RCT for arm cranking as significantly less than for leg cycling. Following the conditioning programs, the absolute values for VT and RCT increased significantly for exercise with trained as well as untrained limbs. No significant difference was recorded for either training group or exercise mode for the relative measures of VT or RCT. It was concluded that the training stimulus was inadequate to alter the relative measures of VT or RCT.

Ozkan (2008) stated that the significant differences were found between age groups in terms of weight, vertical jumps, SEMO agility run, and ball control. No significant differences were found between any of the remaining variables. Statistical analysis revealed no significant differences between playing experience groups on any of the experimental variables. Correlations indicated that weight, aerobic endurance, anaerobic power, and ball control skill are essential factors in high school soccer.

Kenney (2009) concluded in study as: (1) Cardiovascular Endurance. A significant difference existed between the VRT and CWT
groups for max VO2 on the treadmill run, nut not on the Arm Ergometer. No significant differences existed between the sexes on the treadmill for males and females on the arm ergometer, (2) Muscular Strength. There was not a consistent pattern for the 1. RM scores significant differences existed between the sexes for Hip and Back (.001), Leg Extension (.03), Leg Curl (.008), Arm Cross (004) and Decline Press (.026) 1-RM lifts. No significant differences existed between the CWT and VRT groups. On the Cybex-II males were significantly better than the females for right (.001) and left (.004) leg extension and left arm press (.006). No significant differences existed between the CWT and VRT groups on the Cybex-II, (3) Muscular Endurance. The changes in muscular endurance were significantly (.001) weaker than the males on right arm press. (4) Flexibility. No significant differences existed between VRT and CWT or for males and females for either shoulder extension or trunk flexion. (5) Body Fat. A significant difference existed between males and females on body fat. No significant differences existed between the CWT or VRT groups.

Ramadan (2000) conducted the study to examine the maximal oxygen consumption (V02 max), maximal anaerobic power (AP max), body consumption (BC), somatotype (ST), the Profile of Mood States (POMS) and the State Trait Anxiety (STAI) characteristics of the Kuwaiti World Cup Soccer Team.

Analysis by playing position revealed the goalkeeper to have higher AP max, per cent fat, mesomorphy, and both state and trait anxiety levels, along with lower V02 max, compared to players of other positions. Midfielders had the highest V02 max and were the leanest. Offensives exhibited the lowest tension, depression, anger, confusion,
and trait anxiety levels. The defensives' primary differentiating was a high AP max, comparable to that of goalkeepers. The starters were significantly older, less fat, and were higher in both state and trait anxiety than the substitutes.

The findings indicated that the cognitive strategy of elite Male Marathoners was significantly different (p < .01) from that of non elite marathoners. Differences were found between male and female marathoners with female being significantly higher on the Measure of confusion (p < 0.05) and the trait of neuroticism stability (p < 0.01) the performance levels could not be predicted from these characteristics there were no differences between elite & non elite marathoners.

Intosh (2010) investigated that significant reductions for the experimental group were found for total body weight, resting systolic blood pressure, and RPE max. Significant increase for HDL-c and HDL/TRC ration were demonstrated by the experimental groups as a result of endurance training. A 6.7% improvement in maximal oxygen uptake (VO2 ml/kg. min.) was found for the experimental group in response to the 16 months data collection period. Submaximal walking measures (heart rate, Systolic blood pressure, and oxygen uptake) were all found to decrease significantly, indicating an improved efficiency for these cardio-respiratory measures.

Kim (2011) was conducted that VO2 max was the strongest determinant in discriminating GDR from MDR group, and contributed most heavily to the prediction of 10 km performance. The other variables studies did not indicate a strong discriminative and predictive ability.