Review of Related Literature

A serious and scholarly attempt has been made by the research scholar to go through the literature related to the study. The relevant studies of specific important are cited below.

Kaur et al. (2000) the purpose of the present study was to find out the relationship of the selected anthropometric variables contributing to success in cricket viz; batting, bowling and wicket keeping. Thirty male cricket players who represented their states in the national cricket competition were randomly selected for the study. They were further classified in three equal groups as per their playing position i.e. 10-batsmen, 10 bowlers and 10 wicket keepers. The grading and performance were judged in the light of ten point scale by a panel of three professional judges. The score was average rating of three experts. Anthropometric measurements including linear measurements, diameters and circumferences were taken by following the standard techniques of Tanner et al. (1969). The relationship of fifteen anthropometric measurements with performance in batting, bowling and wicket keeping were studied, coefficient of correlation was computed to find the relationship of various anthropometric measurements to performance in cricket. It was analysed that performance in batting is more a function of arm length, leg length, and shoulder width and fore arm girth. Height and shoulder width help the bowlers to perform better and wicket need to be shorter to excel in the game of cricket. It has been established that attainment of such characteristics helps the cricketers to perform better during competition.

Reilly et al. (2000) this review is focused on anthropometric and physiological characteristics of soccer players with a view to establishing their roles within talent detection, identification and development programmes. Top-class soccer players have to adapt to the
physical demands of the game, which are multifactorial. Players may not need to have an extraordinary capacity within any of the areas of physical performance but must possess a reasonably high level within all areas. This explains why there are marked individual differences in anthropometric and physiological characteristics among top players. Various measurements have been used to evaluate specific aspects of the physical performance of both youth and adult soccer players. The positional role of a player is related to his or her physiological capacity. Thus, midfield players and full-backs have the highest maximal oxygen intakes (>60 ml.kg\(^{-1}.\) min\(^{-1}\)) and perform best in intermittent exercise tests. On the other hand, midfield players tend to have the lowest muscle strength. Although these distinctions are evident in adult and elite youth players, their existence must be interpreted circumspectly in talent identification and development programmes. A range of relevant anthropometric and physiological factors can be considered which are subject to strong genetic influences (e.g. stature and maximal oxygen intake) or are largely environmentally determined and susceptible to training effects, consequently, fitness profiling can generate a useful database against which talented groups may be compared. No single method allows for a representative assessment of a player’s physical capabilities for soccer. We conclude that anthropometric and physiological criteria do have a role as part of a holistic monitoring of talented young players.

Raven et al. (2012) the purpose of this study was to evaluate the physiological functions of a professional soccer team in the North American soccer League (NASL). Eighteen players were evaluated on cardiopulmonary function, endurance performance, body composition, blood chemistry and motor fitness measures near the end of their competitive season. The following means were observed: age, 26 yrs; height, 176 cm; weight 75.5 kg; resting heart rate, 50 beats/min; maximum heart rate (MHR), 188 beats/min; maximum oxygen intake (VO2 max),
584 ml/kg.min\(^{-1}\); maximum ventilation (VE\(_{\text{max}}\) BTPS), 154 L/min; body fat, 9.59%; 12-min run, 1.86 miles, and Illinois agility run, 15.6 secs. Results on resting blood pressure, serum lipids, vital capacity, flexibility, upper body strength, and vertical jump tests were comparable to values found for the sedentary population. Comparing the results with previously collected data on professional American football backs indicated that the soccer players were shorter; lighter in body weight; higher in VO\(_2\) max (4 ml/kg.min\(^{-1}\)) and body fat (1.8%); and similar in MHR, VE max, and VC. The 12-min run scores were similar to the initial values observed for the 1970 Brazilian World Cup Team. The agility run results were superior to data collected from other groups. Their endurance capabilities, agility, and low percent of body fat clearly differentiate them from the sedentary population and show them to be similar to that of professional American football backs.

Jovanavic et al. (2011) the purpose of this study was to determine similarity and differences in morphological and situational parameters between futsal and soccer. The research was conducted on a sample of 82 subjects: 40 male futsal players and 42 male soccer players. In addition to height and body mass eight other anthropometric measures were presented. Situational parameters were represented by nine variables. Effect size of variables ranged from 0.0001 to 0.062. Statistically significant difference was not determined among futsal and soccer players in the parameters of morphological characteristics. Futsal and soccer players have showed significant differences in the parameters of the number of gained possessions of the ball and number of runs with the ball at the level of significance p<0.01. The other situational efficiency variables have shown no significant difference between these two types of team sports. The results of this study have shown that the futsal and soccer players differ only in two situational parameters. The difference in morphological variables was not found due to the fact
that futsal players were mainly ex-soccer players. This finding suggests that futsal needs more specialized approach when starting in this sport.

Kostic et al. (2009) the aim of the research was to determine the nature of the relation between the anthropometric characteristics and coordination skills on a sample of girls and boys. A total of 91 boys and 85 girls made up the sample of subjects. They were all first grade elementary school students from Nis. We used three measures for the evaluation of longitudinal dimensionality (body height, leg length, and arm length), three measures for the evaluation of transversal dimensionality (Shoulder width, pelvic width and hip width), five measures for the evaluation of circular dimensionality and body mass (body weight, thorax volume, upper arm volume, thigh volume and calf volume) and five measures for the evaluation of subcutaneous fatty tissue (triceps skin folds, sub scapular skin folds, abdominal skin folds, thigh skin folds and medial calf skin). The following measuring instruments were used for the evaluation of coordination skills: horizontal jump rope, 20 side steps with a baton, and running and rolling (a newly constructed test). A multivariate analysis of variance showed that there is a statistically significant difference between the coordination skills of the boys and girls at the p=0.03 level. There is no statistically significant connection between the anthropometric characteristics and coordination skills for the sample of boys, while there is on for the girls. The resulting canonical factor of anthropometric characteristics was define as the factor of transversal dimensionality, circular dimensionality and subcutaneous fatty tissue, and the canonical factor of coordination skill was defined as the general factor of coordination.

Kumar (2007) the purpose of this study was to compare the selected physical and anthropometric variables of javelin throwers and fast bowlers. Selected Physical variables were strength and flexibility, these included arm strength, back strength, leg strength, wrist flexibility,
shoulder flexibility, hip flexibility, ankle flexibility and spine flexibility. The anthropometric variables were weight, standing height, thigh girth, chest girth, leg length and arm length. The subjects were thirty male sportsmen comprising of fifteen fast bowler and fifteen javelin throwers. The measures of all the selected variables were recorded at the human performance laboratory of lakshmibai national institute of physical education Gwalior. The instrument used were leg and back dynamometer; flexometer case, ruler guide, yard stick simple goniometer, standard weighing machine and steel tape. The data were analyzed by using ‘t’ ratio for comparing the selected physical and anthropometric variables of javelin throwers and the fast bowlers. The level of confidence was set .05 level of confidence with 28 degree of freedom. The result of the study showed that there is significant difference in the arm strength, back strength and weight between fast bowlers and javelin throwers as the obtained value were found to be greater than the table value required for significance at .05 level of confidence with 28 degree of freedom 2.05. all other variables showed insignificant difference between javelin throwers and fast bowlers.

Sporis et al. (2009) the purpose of this study was to evaluate whether players in different positional roles have a different physical and physiologic profile. For the purpose of this study, physiologic measurements were taken of 270 soccer players during the precompetitive period of 2005/06 and the precompetitive period of 2006/07. According to the positional roles, players were categorized as defenders (n=80), midfielders (n=80), attackers (n=80), and goalkeepers (n=30). Analysis of variance (ANOVA) was use to determinate differences between team positions. Goalkeepers are the tallest and the heavies players in the team. They are also the slowest players in the team when sprinting ability over 10 and 20 meters is required. Attackers were the quickest players in the team when looking at sprint values over 5, 10, and 20 meters.
There were statistically significant difference between attacker and defenders when measuring vertical jump height by squat jump. Goalkeepers were able to perform better on explosive power tests (squat jump and countermovement jump) than players in the field. Midfielders had statistically significant superior values of relative oxygen consumption, maximal heart rate, maximal running speed, and blood lactate than defenders and attackers. Defenders had more body fat than attackers and midfielders (p<0.05). Coaches are able to use this information to determine which type of profile is needed for a specific position. It is obvious that players in different positions have different physical and physiologic profiles. Experienced coaches can use this information in the process of designing a training program to maximize the fitness development of soccer players with one purpose only, to achieve success in soccer.

Zar et al. (2008) performing exercises at a satisfactory level depends on physiological, anthropometric, psychological factors. These factors are found in many of the models which are used to analyze the performance in different exercises. The precondition for any progress is having physical abilities. Knowing the anthropometric and physiological characteristics of players in each type of exercise is the most important and effective factor in their performance.

The purpose of this study is to survey the physical fitness of male Taekwondo athletes of the Iranian national team during the period from 2001 to 2005. This research is of the descriptive type. For this purpose we have examined members of the national team during the period from 2001 to 2005, as a static society. The national team is composed of 10 member each year (N=10, M age=21 SD=1.78, M height=172.06 SD=4.68). Different factors of physical fitness and anthropometric characteristics were studied. Our findings show that the best records were registered during the year 2001 and 2002, while the worst ones were registered in 2005. Despite these facts, the fitness of the national team during these years has decreased.
Meszaros et al. (2000) sport anthropology has developed from the techniques and results of general physical anthropology. Thus, in the beginning the main questions and methods were also similar to those of general physical anthropology, only the investigated subjects were taken of a different population. Following the initial, mainly descriptive and comparative, phases of data manipulation, the predictive functions of sport anthropology have also developed. Continuous progress in the methods of sport training, consequently in athletic performances and the changes in athletic rules and equipment, have developed a need for the investigation of such (indirect) human biological factors that may have a role in competitive sport performance. The analytical approach in sport anthropology has only become dominant during the past 10 years. A clear recognition of the relationship between structural characteristics and functions can – beyond the scientific importance of the matter – help sports practice in both the selection of talented youngsters and the process of athletic preparation. The most recent tendencies in sport anthropology attempt to answer such questions that cannot be connected to the direct and traditional measurements of physical anthropology. An analysis of the relationship between inherited characteristics (physique and metabolic pathways, functional regulation during exercise, etc.) means a new challenge for sport anthropology.

Koropanovski et al. (2011) karate tournaments consist of two equally important karate disciplines: the kumite and kata competitions. Due to being based both on the distinctive selection of movement techniques and their kinematic and kinetic patterns, we hypothesized that the elite kumite and kata competitors could differ regarding their anthropometric and physical performance profiles. Thirty-one senior male karate competitors of the assessment of anthropometric (body height, mass and body mass index) and the following physical performance measurements: the adductor and hamstring flexibility (sideward leg splits test),
speed and acceleration (20-m sprint test with 10-m acceleration time), explosive power (countermovement and standing triple jump), agility (“T” – test) and aerobic endurance (20-m multistage shuttle run test). The kumite competitors revealed a larger body size through body height (p=0.01) and mass (p=0.03), while the differences in body composition were non-significant. The kumite competitors also demonstrated higher acceleration (p=0.03) and explosive power (standing triple jump; p=0.03). A 6-7th higher flexibility of the kata competitors remained somewhat below the level of significance (p=0.09). The findings could be interpreted by the distinctive differences in the movement techniques. Specifically a higher explosive power could be beneficial for kumite, while both a smaller stature and higher flexibility (particularly of the lower extremity) could be important for the exceptionally low postures of the kata competitors. Although further elucidation is apparently needed, the obtained finding could be of importance for both the early selection and training of karate competitors.

Fuentes (2010) the purpose of this study is to develop a prediction equation for (performance variables) vertical jump, broad jump, 40-yard sprint time, and pro-ability shuttle time using body mass and 1-RM values of strength for bench press and back squat. Participants (n=76) used in the study were members of the University of South Florida D-1 football team in fall of 2009. Squat/BM demonstrated the strongest relationship in both correlation and multiple regression data for every performance variable. Squat 1-RM and Squat/BP indicated a decreased relationship and negative impact on performance. Results indicate that with increased Squat/BM improvement for all performance variables can be achieved. In addition analysis divided the entire football team into three positions (AT, LN, and SK) and noted differences for 10 of the possible 12 mean comparisons of performance variables.
Koley et al. (2010) the purpose of this cross-sectional study as of two-fold: firstly, to evaluate the back strength of India inter-university male cricketers and secondly, to study its relation to leg strength, along with selected anthropometric characteristics. Thirteen anthropometric characteristics were from 98 Indian inter-university male cricketers aged 16-25 (mean age 21.03,±1.13) were also collected from students at the host university for comparison. The findings of the present study indicated statistically significant differences (p≤0.05) in weight, BMI, thigh length, total leg length, biceps, triceps, subscapular and calf skinfolds, percentage of body fat and back strength between the cricketers and control participants. The striking findings of the present study were that back strength showed significant positive correlations only with leg strength but not with any of the other studied anthropometric characteristics.

Gangta et al. (2012) the present study was to determine the anthropometric, physical and physiological, parameters as predictors of performance in female volleyball players. The subjects for the study were fifty (N=50) female intercollegiate volleyball players from affiliated colleges of Punjab University, Chandigarh were selected randomly to serve as the subjects for the study. Twenty six anthropometric, physical and physiological variables were chosen to serve as independent variables. Performance in volleyball was selected as the dependent variable. Performance score was obtained through a subject rating in playing ability for each player by a panel of three experts, who evaluated and rated each player on a scale of 5 broad areas of passing, serving, setting, blocking and attacking. In case of women volleyball players height standing (0.376), height sitting (0.360), arm length (0.494), and leg length (0.457) speed (0.312), grip strength (R) (0.471), and power (0.314) as measure y vertical jump to volleyball playing ability showed significant positive correlation with volleyball playing ability.
Dominic (2009) physical characteristics of athletes have greatly documented to influence performance negatively or positively, without exception to basketball. The study was conducted to find out the relationship between physical characteristics and shooting ability of Kwara State junior and senior basketball teams formed the samples of twelve and fifteen each for the study. It was found that there were no significant differences in the shooting ability and no significant relationship between the shooting ability (p>r) and the upper and lower body length segments of the junior and senior players. This indicates that there is no particular body segment that contributes independently to shooting ability but a sequential combination of them. Therefore there is a need for the Kwara state basketball teams to improve on their shooting skills through specialized practice of the different shots, through a well harnessed daily programme. Also, coaches need to study each player shooting mechanics in order to correct, where necessary, for better shooting percentages.

Yamaner et al. (2011) football is the most popular sport in the world. Foot morphology and foot preference are important factors in football player’s performance. The aim of this cross-sectional study was to evaluate the foot morphology of elite football players with different foot preferences. 407 male football players participated in this study. 328 of them preferred their right foot, while 79 of them preferred the left one. Eleven anthropometric measurements were taken from each foot with standard anthropometric methods. Foot length, T1, T2, T3, T4 and T5 lengths, foot circumference of right and left feet and right foot width of right foot preference group were higher than those of left foot preference group, which is statistically significant (p<0.05). Left foot measurements of right foot preference group were interestingly higher than those of the right side. It was suggested that these data may be useful to define the foot morphology of elite football players.