CHAPTER – II

REVIEW OF RELATED LITERATURE

Study of the related literature comprises locating, reading and evaluating reports of research as well as reports of casual observation and opinion that are related to the individual’s planned research report. A study of relevant literature is an essential step to get a full picture of what has been done with regard to the problem under study. An attempt has been made to bring a brief review of research related to the present study to form the background for the present study.

Kioumourtzoglou et al., (1998) investigated the differences among athletes of differing skill should assist successful identification and selection of the best athletes in a specific sport. For the purpose of this study, a laboratory study was conducted with a group of age, and a control group of 13 men from the elite male national team of basketball players, 22 to 23 years of age, and a control group of 15 men of equal age (physical education class) to assess differences in their scores on cognitive skills (memory-retention, memory grouping analytic ability), perceptual skills (speed of perception, prediction, selective attention, response selection), and motor skill (dynamic balance, whole body coordination, wrist finger dexterity, rhythmic ability). Analysis showed that elite male basketball players scored higher on hand coordination and lower on dynamic balance given their anthropometric measurements. Elite
players were better on memory–retention, selective attention, and on prediction measures than the control group. The above skills are important in basketball performance.

Turner et al., (1999) conducted a research to test the validity of the game for understanding model by comparing it to a technique approach to instruction and control group. The technique method focused primarily on skill instruction where the skill taught initially was incorporated into a game at the end of each lesson. The games for understanding approach emphasized developing tactical awareness and decision making in small game situations. Two physical education specialists taught field hockey using these approaches for 15 lessons (45 min each). The control group did not receive any field hockey instruction. Data were collected from 71 middle school children. Pretests and posttests were administered for hockey knowledge, skill and performance. Separate analysis of variance or analysis of covariance were conducted to examine group differences for cognitive and skill outcomes. The games for understanding group scored significantly higher on passing decision making than the technique and control groups during posttest game play significantly higher than the control group for declarative and procedural knowledge. The game for understanding group scored significantly higher on control and passing execution than the other groups during posttest game play. For hockey skill, there were no significantly differenced among the treatment groups for accuracy, but the technique group recorded faster times than the control group on the posttest.
Dasgupta et al., (2000) underwent a scientific study among short distance runners, middle distance runners, middle distance runners and long distance runners were subjected to graded exercise on a treadmill. The maximum aerobic power (Vo2 max) and other indices related to oxygen transport system viz. heart rate, breathing reserve, dyspnoeic index, O2 pulse and RQ were recorded at respective VO2 max loads, and the values were compared. Long distance and middle distance runners showed significantly higher VO2 max than the short distance runners when VO2 max was expressed per unit of body weight. Among the endurance runners, long distance runners had a significantly lower resting pulse rate as well as the maximum heart rate during work than the middle distance runners. On comparison, ventilation volume, breathing reserve, dyspnoeic index, O2 pulse and RQ at VO2 max workloads do not differ significantly among different categories of runners.

Hoare DG (2000) Talent identification programs have traditionally focused on individual sports with discrete physical and physiological characteristics. Limited attention has been directed toward predicting performance in team sports. This study measured anthropometric and physiological attributes of 125 male and 123 female junior basketball players competing at the Australian Under 16 championships in 1998. In addition, experienced coaches rated the performance of players during the championships. Performance profiles were compared across playing positions and by playing performance (Best versus Rest) Differences in anthropometric
characteristics were present across some playing positions for both males and females. Speed and agility differences between some playing positions were also present. Best players differed to rest players on a number of anthropometric and physiological variables for both males and females. Regression analyses indicated the test variables accounted for a significant proportion of variance in playing performance for both females (41.3%) and males (38.3%) A Z score analysis indicated good alignment between the test coach ranking of the best player in four out of five positions for females and two out of five positions for males. Anthropometric and physiological profiling can contribute to selection procedures in junior basketball, however determinants of success are multi-factorial.

Hoeger et al., (2000) compared the Heart Rate (HR), oxygen uptake (Vo2 max), and Rate of Perceived Exertion (RPE) between Self-Paced Water Aerobics (SPWA) exercise and Self-Paced Treadmill Running (SPTR). Thirty three (n=33) participants (19 women and 14 men) performed the two exercise sessions in a random order. Participants were allowed to work at their preferred aerobic intensity during a 11-min session in water (SPWA). The first 5 min of exercise were used as a warm-up phase. During this phase the participants gradually increased exercise intensity to their desired aerobic pace. For the final 6 min, participants exercised at their preferred pace but were allowed to increase or decrease intensity as they wished (rate of limb movement in water or treadmill speed on land). No verbal or physiological
feedback was provided during the tests. Exercise Heart Rate (HR) and oxygen uptake (VO2) data were collected at one-min intervals during the workouts and an average of the last 6 min of exercise was used for data analysis purpose. A Rate Perceived Exertion (RPE) was obtained at the end of each exercise session.

A maximal treadmill test was also administered and determined HR max, VO2 max and EPF max. Respective physiologic responses for SPWA and SPTR were as follows: HR =152.4 versus. 163.2 b.min, VO2 = 32.5. Repeated measures. ANOVA revealed significant difference (P< .01) between the two exercise modalities in HR only. Although exercise HR was 8.7% lower during SPWA, no differences were found between the two exercise modalities in VO2 and RPF. During SPWA, participants exercised at 79% and 69% of land – based HR max VO2 max. These results indicate when the participants are asked to exercise at their preferred aerobic intensity, both water aerobic and treadmill running or of similar exercise intensity. Furthermore, during self-paced exercise, both of these activities met the ACSM guidelines for the development and maintenance of cardio-respiratory fitness.

Rojas et al., (2000) analysed the adjustment in technique made by a basketball players when shooting an opponent. The subjects used consisted of 10 professional basketball players of the Spanish First Division League. Three dimensional motion analysis based on video recording (50 Mz) was used to obtain the kinematics characteristics of basketball jump shots with the without
an opponent. It was found that when performing against an opponent the release angle of the ball increased, the flight time was reduced and postural adjustment as determined by the angles at the knee and shoulder increased, all significantly. There were several other non-significant differences that helped to interpret the changes in technique imposed by the presence of an opponent. It was suggested that when shooting with an opponent, players attempted to release the ball more quickly and from a greater height. This strategy will lessen the chance of opponent intercepting the ball. Tie was concluded that the differences noted in the technical execution of the skill had implications for practice. It was suggested that training would benefit from practice with an opponent for at least some of the time to condition players to the demands, which they were more likely to meet in the game situation.

Todd et al., (2000) examined the influence of terrain and cycling speed and thus quantify and profile lactate, heart rate, and perceived exertion responses of 12 United States Postal Service’s professional cycle team members who participated in a 5 hr field test. participants consumed their regular evening meal, slept on average of 9 hr in their training hotel and then consumed the team’s morning meal. Ninety min later, the participants began a 45 min team warm-up ride (flat terrain 15 mph). After 45 min, stage one:a “simulated competitive hill training ride of 6.1 miles” was conducted (2-minutes interval between riders, race conditions near maximal effort). At the completion of the hill ride, the following measures were immediately
determined: heart rate (HR), perceived exertion of legs (RPE-LEGS), and circulating lactate concentrations (LA). After stage one, the team conducted a 2 – hr ride working on team cohesion (semi flat terrain, 15 – 20 mph). During this time, each participant’s hydration and nutrition consumption was monitored and analysed yielding no difference in macronutrient consumption. Following the 2 – hr cohesion ride, stage 2 involved riding 6.0 miles on flat terrain as fast as possible duplicating the data collection methods of Stage one.

Trninic et al., (2000) developed a model to assess the various factors associated with the performance of basketball players. Position – I levels of defensive pressure, transition defense efficiency, the ball control, passing skills, dribble penetration, outside shots, and transition offence efficiently; position – II level of defensive pressure, transition defense efficiency, outside shots, dribble penetration, offense without the ball, and transition offence efficiency; Position III – transition, defense efficiency, outside shots, dribble penetration, offence without the ball, free throws and transition offence efficiency; Position IV – defensive and offensive rebounding efficiency, inside shots, dribble penetration, efficiency of screening, and free throws: Position V – defensive and offensive rebounding efficiency inside shots, dribble penetration efficiency of screening, drawing fouls and three point players and free throws. The research could be usefully applied by the basketball practitioners to selecting and following up players, the teaching–learning process directing and improving, the training process programming and the transformational effect controlling.
Wisloff, et al., (2001) Physiological studies of long–term cardiovascular adaptation to exercise require training regimens that give robust conditioning effects and adequate testing producers to quantity the outcome. We developed a valid and reproducible protocol for measuring maximal oxygen uptake (VO2max), which was reached at a 25 degrees inclination with a respiratory exchange ratio > 1.05 and blood lactate > 6 mmol /l. The effect of intensity – controlled aerobic endurance training was studied in adult female and male rats that ran 2h/day, k day/wk, in intervals of 8 min at 85-90 % of VO2 max and 2 min at 50-60 % of VO2 max, with adjustment of exercise level according to VO2 max every week. After 7 week, the increase in VO2 max plateaued at 60-70 % above sedentary controls. Ventribular weights and myocyte length were up to 25–30 % and 6–12 % respectively. Work economy, oxygen pulse, and heart rate were sufficiently changed to indicate substantial cardiovascular adaptation. The model mimics important human responses to training and could be used future studies on cellular, molecular and integrative mechanism of improved cardiovascular function.

Boussanna et al., (2002) investigated the possibility of three being in respiratory muscles strength and endurance in elite and competition triathletes who have similar maximal oxygen uptakes (VO2 max) and ventilatory thresholds (Th(vent)). Five internationally – ranked elite, mean (SD) age 23.8 (1.4) years) and six nationally and regionally ranked competition (age 21.1 (1.1) years) male triathletes and Th(vent) and second 20 min of cycling
followed by 20 min of running (C-R) at intensities higher than 85% VO2 max. Cardioventilatory data were collected every minute during the tow trails, using an automated breath-by-breath system. Maximal expiratory and inspiratory (P(Imax)) strength were assessed before and 10 min after C-R from the functional residual capacity. Respiratory muscle endurance was assessed first day before and 30 min after C-R by measuring the time limit (t(lim)). The results showed firstly that during C-R, the competition triathletes had significantly (p < 0.05) higher minute ventilation (mean (SEM) 107.4(3.1) compared to 99.8 (3.7) l x min (-1), breathing frequency (44.4(2.0) compared to 40.2 (3.4) x min (-1) and heart rate 9166 (3) compared to 159 (4) beats x min (-1) and secondly that after C-R, they had significantly lower P(Imax) 127.1 (4.2) compared to 130.7 (3.0) cmH2O and t (lim) (2.35 (0.29) compared to 4.12 (0.20) compared to 130.7 (3.0) cmH2O and t (lim) (2.35 (0.29) compared to 4.12 (0.20) min) than the elite triathletes.

Sanita et al., (2002) more than 500 000 men play “gentlemen’s” recreational hockey in Canada, but the safety of this exercise has not been studied. Exercising at extremes of intensity has been associated with an increased risk of cardiac events. Our objective was therefore to determine baseline cardiac risk factors among adult recreational hockey players and to measure any cardiac abnormalities they experienced while playing hockey. They assessed baseline cardiac risk factors in 113 male volunteers recruited from a recreational hockey league. Each subject underwent holter electro-
cardiographic monitoring before, during and after at least one hockey game (maximum of 115 holter data sets). We used the data to assess exercise heart rate, arrhythmias and ST – segment changes and for correlation with symptoms and other predictors of fitness. For all participants, maximum heart rate (HR max( (mean 184 (SD 11) beats/min) was greater than target exercise heart rate (calculated as 55% to 85% of age – predicted HR max, and in 87 (75.6%) of the 115 holter data sets, the heart rate exceeded the age – predicted HR max was 30 (SD 13) min. For 80 (70.1%) of 114 data sets, heart rate recovery monitoring sessions and ST-segment depression in data from 15 sessions. The physical activity pattern that occurred during recreational hockey caused cardiac responses that might be dangerous to player’s health. More specifically, the players’ exceeded target and maximum heart rates, had poor heart rate recovery after exercise, and had episodes of non-sustained ventricular tachycardia and ST – segment depression of uncertain clinical significance.

Boutcher et al., (2003) conducted a study on stroke volume response of trained cyclists (n-10; Trained), Active but untrained men (n-10’ Active), and sedentary men (n-10; Sedentary) was determined by impedance cardiography during cycle ergometer exercise. For the Trained, at a heart rate of beats mon’l stroke volume increased by 27% compared to baseline levels, whereas stroke volume of Active and Sedentary groups did not significantly increase. Throughout exercise indices of ventricular emptying and filling of Trained were significantly greater than that of the other two groups whereas ventricular
rates of the Active were significantly greater than that of the sedentary. Throughout the exercise cardiac contractility of the Trained was significantly greater than that of the other two groups. Results indicate that despite similar resting heart rate, stroke volume, ventricular filling, and cardiac contractility during incremental ergometry exercise.

Active, compared to sedentary men, however, displayed significantly larger stroke volume and ventricular filling rates during ergometry. We conclude that impedance cardiography indices of ventricular performance of aerobically trained men were superior to those of active, untrained men possessing similar resting stroke volume and heart rate. Furthermore, the ventricular performance of the active men possessing large resting stroke volume was superior to that of sedentary men.

**Belfry et al., (2003)** investigated the effects of repeated bout of high – intensity leg cycling exercise on aerobic poser and cycling performance were examined. Subjects were recreationally and competitively active males (4) and females (5) subjects completed 14 exercise sessions over 7 weeks. Exercise consisted of two bouts of heavy-intensity exercise (H) of 8 min, each followed by a similar recovery period of variable duration (3-30 min). A maximal performance rides leading to exhaustions in 2 – 8 (several – intensity, S) followed the second exercise bout. VO2 max was measured at the start and end of the testing period; time – to – fatigue (TTF) and VO2 were measured during each session. VO2 max increased (p<0.01) from 47 to 53 ml. kg. min and maximal work.
**Stickland, et al., (2003)** noted that the agility and co-ordination test the accuracy of the 20-m multi-stage shuttle run (SR) test to predict VO2 max in young adults. VO2 max was measured during a graded treadmill test in 60 men and 62 women (mean age 25.3; 25.1 years, respectively). Each subject was familiarized with the SR procedure and then completed the SR test to predict VO2 max on a separate day. The mean terminal SR state was 9.5 for men and 7.8 for women. The regression equations of Larger et al., (1998) & Lager and Gadoury (1989) systematically under predicted VO2 max for both male and female (p < 0.05). New regression equations were developed from present data to predict VO2 max for males \( Y = 2.85 X + 28.8 \) (\( r^2 = 0.77, \text{SEE} = 4.07 \text{ ml.kg}^{-1} \)) and females : \( Y = 2.85 X + 25.1 \) (\( r^2 = 0.66, \text{SEE} = 3.64 \text{ ml.kg}^{-1} \)) where X equals the last half stage of the SR completed. We suggested that these gender distinct equations provide more accurate predictions of VO2 max from the SR.

**Apostolidis et al., (2004)** conducted a exploratory research comprises two fold aims. First one is to describe the physiological and technical characteristics of elite young basketball players and second one is to examine the relationship between certain field and laboratory test among these players. Thirteen male players of the junior’s basketball National team (age:18.5+/-0.5 years, mass: 95.5+/- 8.8kg, height 199.5+/- 6.2 cm, body fat: 11.4+/- 1.9%, means +/-SD) performed a run to exhaustion on the treadmill, the Wingate test and two types of vertical jump. On a separate day, the fields tests (control
dribble, defensive movement, speed dribble, speed running, shuttle urn and dribble shuttle run) were conducted. Maximal oxygen uptake (VO2 max) and ventilatory threshold were 51.7 +/- 4.8 ml/kg/min and 77.6 +/- 7.0 % VO2 max respectively. Maximum power output was 10.7 +/- 1.3 Wtts/kg and mean power (Pmean) 8.0 +/- 0.7 Wtts/kg, respectively. Performance in control dribble (13.70 +/- -.96s), speed dribble (4.24 +/- 0.75s), high intensity shuttle run (27.90 +/- 1.04s) and dribble shuttle run (29.50 +/- 1.22s) was correlated with Pmen (r=-0.58, r=-0.62 and r=-0.73, respectively, p<0.05). Please body fat was negatively correlated with all the above field tests (r=0.63, r=0.57, r=0.66, r=0.65 respectively, p<0.05).

**Gocentas and Andziulis, (2004)** determined the recovery period of basketball players after maximal load. Thirteen male subjects, aged 19 – 26 years took part in this study. They performed an incremental cardiopulmonary test using an electronically barked bike ERGOLINE 9000. Ventilation and gas exchange were assessed and measured by breath-to-breath method using VMAX229 metabolic card and sensor Medics gas flow analyzer. Heart rate parameters were established during continuous ECG Monitoring and analyzing integrated VMAX and Marquette 3.01 system. Quantitative changes of heart rate, oxygen consumption, double rate product, respiratory quotient, and metabolic equivalent were calculated or established by VMAX application algorithm. A recovery was defined through such parameters: T (HR 90%) (time needed for heart decreasing to 90 bpm), T(DPR90%) (time needed for
90% decreasing from peak respiratory quotient), T(RQ0.9) (time needed for respiratory quotient normalization to 0.9 to a standard value). Full recovery after maximum load was too long and completed during 1200s, but some processes were completed earlier (lactic acid buffering within 95s, oxygen requirement with 620s, and normalization of heart action with in 730s). Further research is needed to explain this peculiarity of recovery.

Laplaud et al., (2004) investigated the effects of a training program on the aerobic aptitudes and the relevance of the instant of equality of pulmonary gas exchange (i.e., RER = 1.00) to assess these effects in professional basketball players. Eight athlete performed two incremental exercise test on a cycloergometer separated by 4.7 +/- 0.7 months. Physiological variables recorded during these two test (heart rate, oxygen uptake, carbon dioxide output, respiratory exchange ratio, power output) allowed to determine the first and second ventilatory thresholds and the instant of equality of pulmonary gas exchange. The training program induced significant variations of resting heart rate, oxygen uptake, and power output measured for the instant of equality of pulmonary gas exchange. Moreover, the used fractions of heart rate, oxygen uptake and power reserves for the instant of equality of pulmonary gas exchange and the second ventilatory threshold increase significantly. Inversely, maximal oxygen uptake, maximal power reached and the used fractions of reserves for the first ventilatory threshold do not differ significantly. Professional basketball training is not focused in drills aiming to
enhance both aerobic poser and aptitude, our results suggested that this training program induce the same physiological changes as typical aerobic training. We also demonstrated that the instant of equality of pulmonary as exchange is a powerful tools to quantity the changes in aerobic aptitudes during the sport season.

Paige Holm et al., (2004) Whether or not isolated endurance training of the respiratory muscles improves whole-body endurance exercise performance is controversial, with some studies reporting enhancements of 50% or more, and others reporting no change. Twenty fit (VO2 max 56.0 ml/kg/min), experienced cyclists were randomly assigned to three groups. The experimental group (n=10) trained their respiratory muscles via 20, 45 min sessions of hyperpnea. The placebo group (n=4) underwent “sham” training (20, 5 min sessions), and the control group (n=6) did no training.

After training, the experimental group increased their respiratory muscle endurance capacity by 12%. Performance on a bicycle time trial test designed to last about 40 min improved by 4.7% (9of 10 subjects showed improvement). There were no test-re-test improvements in either respiratory muscle or bicycle exercise endurance performance in the placebo group, nor in the control group. After training, the experimental group had significantly higher ventilatory output and VO2, and lower PCO2, during constant work-rate exercise; the placebo and control groups did not show these changes. The perceived respiratory effort was unchanged in spite of the higher ventilation rate after training.
Daphne, et al., (2005) examined the effects of the speed function on some technical elements (dribbling, slalom and agility) in soccer, and to determine the effect ratio of these elements on one another. Some information regarding the purpose of this research is given by means of literature review. The subjects of the study, 177 soccer players selected from the first, second, and third league, amateur and two youth teams in Ankara, Turkey, has undergone a performance test including one each of sprint 0-15-30m, slalom 0-15-30m, and dribbling 0-15-30m, and an agility test. Sprint, slalom and dribbling tests were applied twice, with the players resting between each trial. Finally, the agility test was performed. The reliabilities of the test (Sprint = 74; Slalom = 062; Dribbling = .76; Agility = 081) were determined for the players (n=40). The performance value of the subjects examined showed that while speed function does affect the agility competency, it had no effect on shalom and dribbling competency. The other finding showed that slalom and dribbling competencies affect each other positively.

Esteve-Lanao et al., (2005) quantify the relationship between total training load and running performance during the most important competitions of the season (national cross-country championships, 4.175 and 10.130 km races). Eight well-trained, subelite endurance runners (age (mean +/- SD): 23+/-2 years; VO2 max: 7.0 +/- 7.3 Ml.kg.min) performed a maximal cardiorespiratory exercise test before the training period to determine Ventilatory Threshold (VT) and Respiratory Compensation Threshold (RCT)
heart rate was continuously recorded using telemetry during each training session over a six-month macro cycle, designed to achieve peak performance during the aforementioned cross-country races, lasting from late August to the time that these races were held, that is mid-February. This allowed us to quantify the total cumulative time spent in three intensity zones calculated as zone 1 (low intensity, lower than the VT); zone 2 moderate intensity, between VT and RCT); and zone 3 (high intensity, above the RCT). Total training time in zone 1 (4581 +/- 979 min) and 3 (487 +/- 154 min). Total time in zone 2 was significantly higher than time in zones 3 (p < 0.05). A correlation coefficient of $r = 0.79$ ($p = 0.06$) and $r = 0.97$ ($p=0.08$) was found between the total training time spent in zone 1 and performance time during the short and long cross-country races, respectively. The findings suggest that total training time spent at low intensities might be associated with improved performance during highly intense endurance events, especially if the event duration is approximately 35 min. Interventional studies (i.e., improving or reducing training time in zone 1) are needed to corroborate our findings and to elucidate the physiological mechanisms behind them.

Horn, et al., (2005) compared the nature and rate of change in intra-limb coordination in participants who observed a video model (model) with those who practiced based on verbal guidance only (control). Sixteen male novices threw a ball towards a target with maximal velocity using a back-handed, reverse baseball pitch. Participants in the model group immediately
changed their intra limb relative motion to more and concomitant changes in ball speed, was maintained throughout acquisition, without further change. In contrast, the control group showed no change in coordination or ball speed across acquisition. Out findings suggest that demonstrations act as a rate enhancer, conveying an immediate movement solution that is adopted early in acquisition. A model may constrain the learner to perceive and imitate the model’s relative motion pattern as suggested by Scully and Newell (1985). The stability of these new movement pattern questions accounts of learning which suggest that prescriptive, directed learning may result in the “soft assembly” of an inaccurate and temporary movement solution.

Katsanaos et al., (2005) examined the reliability of heart rate responses at given rating of perceived exertion in cycling and walking. Eleven healthy men (Mean age = 27 years, SD = 4) completed three cycling and three walking trails in an alternative order. During each trail, participants were allowed, within 3 min, to adjust the work rate to correspond to given rating of perceived exertion (RPF) values according to the following order: RPF 11, 13 and 15. For cycling as well as walking, at each RPF there were no significant differences between mean and heart rate responses across the three trials (p < 0.05). Mode–specific estimates for heart rate intra-class correlation coefficient and coefficient of variation ranged between 0.08 and 0.91, and 5.6 % and 8.3 % respectively. This study provides absolute reliability estimate for heart rate responses when using RPF in a production format and suggest there
may be RPF – (and mode) specific practice requirements for achieving a reliable heart rate response at a given RPF.

Pyne, et al., (2005) relationship between fitness testing and career progression in the Australian Football League (AFL) are under-explored. This study investigated the relationship between anthropometric and fitness tests conducted at the annual AFL National Draft Camp and subsequent career progression of players. A total number of 283 players were tested over three consecutive camps (1999-2001). The anthropometric and fitness measures were; height, mass, sum of skin fold, 20-m sprint test, vertical jump (standing and bilateral running), agility run and multi-state incremental shuttle run. The five outcome variables were: drafted (Yes/No), AFL debut (Yes/NO), number of SFL games played to the end of 2003, and subjective ratings of career potential and career value (5 point scale) of 205 players (72%) subsequently drafted, 166 (59%) eventually made their AFL debut. Players drafted to AFL clubs were faster over 5 m, 10 m and 20 m, ran further in the shuttle run and ran marginally faster in the agility test than players are not drafted. Multi-regression analysis showed small to moderate correlations (r=0.27 – 0.31) between the designated outcome variables and selected fitness tests: 20-m sprint time (faster, agility run test (faster) and running vertical jump (higher absolute height and smaller difference between left and right sides). Regression analysis for the standing vertical jump relative to standing reach height showed a counterintuitive negative correlation with positive outcomes,
possible reflecting non-compliance with testing procedures by the less successful athletes. We concluded that the 20-m sprint, jump, agility and shuttle run test have a small but important association with career progression of AFL footballers.

Sallet et al., (2005) investigated to evaluate the physical and physiological characteristics of different first (Pro A) and second division (Pro B) professional basketball players, and to relate them to playing position and level of play. A total number of 58 players were divided into Pro A and Pro B groups and were assessed for physical characteristics, maximal treadmill test and a 30 s all–out test. The sample included 22 centers, 22 forwards and 14 guards. Centers were significantly taller and heavier (203.9 +/- 5.3 cm and 103.9 +/- 12.4 kg) than forwards (195.8 +/- 4.8 cm and 89.4 +/- 14 kg), and there were no relationship to the level of professional players. General aerobic capacity is fairly homogenous between playing position and level of play, even if there are observable VO2 max differences due to inter-individual profiles. On the other hand, anaerobic capacity seems to be a better predictor of playing level even though it is not clear whether such capacity comes from specific training in Pro A, or from an initial selection criterion.

Sato, et al., (2005) Stimulation of the vestibular system has been reported to elicit ventilatory and circulatory change in humans. The purpose of this study was to clarify the characteristics of vestibular-mediated ventilatory and circulatory responses in male endurance runners at the onset of passive chair
rotation, which selectively stimulates the semicircular canals. Fourteen runners and fourteen male untrained subjects participated. The vestibular stimulus test, which consists of 180 degrees chair rotations (left or right half–turns on an earth–vertical axis). For duration of 2 s, was carried out on each subject. Inspiratory minute ventilation, tidal volume, respiratory frequency, heart rate, and blood pressure were measured by breath–by–breath and beat–to–beat techniques before, during and after the chair rotation for a total of 60 s. It was found in this study that (1) the relative change of minute ventilation response in the endurance runners was significantly (p < 0.05) greater than in the untrained subjects during and after the rotation, and that (2) no significant group difference were observed in heart rate and mean blood pressure responses during and after the rotation. In conclusion, vestibular – mediated ventilatory response, at the onset of the chair rotation in the endurance runners was significantly greater than that of the untrained subjects. The results from the present study suggests that an increase in vestibule-ventilatory response would be attributed to an adaptation to long-term endurance training.

Venckunas et al., (2005) compared the ultra-long distance runners’ heart morphologic and functional parameters at rest with those of long distance runners’ and middle distance runners’. Standard Doppler I-D mode echocardiography was performed at rest to 22 middle, 31 long and 11 ultra–long adult male distance runners. Long and ultra-long distance runners’ left ventricular mass and left ventricular mass index were larger (p < 0.05) than that
of middle distance runners’ (groups’ means—approximately 288,305 and 250 g as well as 153, 160 and 130 g/m (2), respectively) due to both larger (p < 0.05) end—diastolic interventricular posterior was thicker (10.6, 11.1 and 9.8 mm, respectively). Ultra-long distance runners’ left ventricular mass and mass index did not differ significantly from long distance runners; (p < 0.05), but end-diastolic posterior wall thickness was higher (p<0.05). Ultra-long distance runners’ right ventricular end—diastolic diameter was significantly larger (p<0.05) than that of middle and long distance runners (groups means – 25.8, 20.7 and 21.4 mm, respectively). Right ventricular end—diastolic free wall was thicker in ultra-long distance runners as compared with middle distance runners (groups’ means 6.7 and 5.9 mm, respectively; p <0.05). Diastolic left ventricular function (evaluated as E/A) as well as end—diastolic left ventricular diameter (groups’ mean – 55.5 – 56.4 mm) did not differ between groups (p<0.05). The hypertrophy of ultra-long distance (as well as long) runners’ myocardium of both ventricles is more pronounced than that of middle distance runners.

**Wilde et al., (2005)** three similar six-element key press sequences were participated under blocked and random practice schedules with acquisition conducted one day and retention and transfer on the next day. The task required participants to type, as quickly as possible, one of the three six—element sequences as observed on a computer monitor. In blocked practice, participants completed all practice in one repeated sequence before the next
repeated sequence was introduced. In random acquisition practice, the three repeated sequences were randomly presented to the participants. The data suggest that random practice results in participants adopting a uniform response structure, while blocked practice allows participants to exploit unique sequential aspects of the individual tasks. This finding suggest that random practice may not be as effective as blocked practice when one of the tasks being practiced together can be optimized through the development of a unique response structure.

Cleary et al., (2006) investigated the additive effects of self–regulation training in forethought, performance, and self–reflection phase processes on acquiring a novel motoric skill (i.e., basketball free throws) and self–reflective beliefs were studied with 50 college students. The results showed a positive linear trend between the number of self-regulatory phase, in which the participants were trained, and their free throw shooting performance and shooting adaptation. The second and third phase training groups displayed significantly more accurate free throws and were able to selfcorrect their shooting form more frequently missed shots than all other groups. Participants who received three phase training displayed the most adaptive motivational profile, characterized by making strategic attributions and adaptive inferences and by using self-process criteria during self-evaluations.

Ford et al., (2006) examined the importance of action–effect for the performance of a soccer kick. Novice, intermediate, and skilled players
performed a soccer chip task with the intentions of getting the ball over the eight barrier to a near or for ground level target under three conditions: full vision, no vision following ball contact with and without knowledge of results (KR). The removal of vision of the ball trajectory resulted in increased radial error, irrespective of the presence absence of KR but in a skill – level and target dependent manner. At the near target, novice participants relied on ball trajectory information. Intermediate performers were affected by its removal across both target conditions, whereas skilled participants were not affected by the removal of ball vision. Variability in knee-ankle coordination significantly decreased when vision of the ball trajectory was removed, irrespective of KR and skill level. Although across skill level there was evidence that action-affects information is used to execute the action when it is available, only at the lower levels of skill did this information aid outcome attainment. There was no evidence to suggest that increasing the skill the dependence on this information increases.

Leleu and Cotrel, (2006) Body composition is an essential factor in athletic performance of human sprinters and long distance runners. However, in horses, many questions remain concerning relationships between body composition and performance in the different equine activities. To determine relationships between body composition, body score, physiological and locomotor variables in a populations of young standardbreds in training. Twenty–four 2 year old standardbreds were studied, body condition on a scale
0 – 5 and body weight recorded, and height at wighers measured. Percentage of fat (%F), Fat Mass (FM) and Fat Free Mass (FFM) were estimated echographically. During a standardized exercise test on the tract, velocity, heart rate, respiratory frequency and blood lactate concentration of 4 mmol / l and velocity of 200 beats/min) calculated. Basic gait variables were measured at three different speeds with an acelerometirc device.

Body composition variables : %F were significantly related to body condition score and physiological variables. Body score was highly correlated to %F (r=0.64) and FM (r=0.71). V4 was negatively correlated to %F (r= -0.39 and r= -0.37, respectively, p<0.1). No relationships were found between body composition and gait characteristics.

Loock et al., (2006) underwent a comparative study on batman’s running and turning speed during three runs while wearing either traditional batting pads or one of two models of newly designed cricket batting pads. Fifteen cricketers participated. The running and turning speeds were measured on three different days with players using the three pairs of batting pads for each trial in random order. The weights of the pads were 1.85 kg, 1.70 kg and 1.30 kg for P1, P2 and P3 respectively. Each player had to run three runs (3X17.68), with the times recorded at the completion of each run, as well as the time to cover the distance from 5 m before and after the turn at the end of the first run. The fastest time from two trials for each pair of pads was retained for analysis. An analysis of variance (ANOVA) with repeated measures was used
to determine the differences among the mean time of the three trials. The trails showed no significant differences between the type of batting pads and the time to complete the run-three-runs test (P1=10.67 +/- 0.47 s; P2=3.53 +/- 0.34 s; P3=3.51 +/- 0.36 s). Of the 45 trails of three runs used for analysis, P1 recorded the fastest time on 16 trails (36%), P2 on 19 trials (42%) and P3 on 10 trials (22%). The results showed no significant differences in the running speeds, although there may be some practical relevance to using the newly designed cricket batting pads.

Mohlenkamp, et al., (2006). Regular physical exercise is recommended to reduce cardiovascular mortality. Yet, atherosclerosis is the main cause of exercise associated with a person beyond the age of 35. The need for risk stratification in marathon runners is under discussion. The predictive value of modern imaging and non-imaging-based markers of risk that can be used for risk stratification in masters endurance athletes still deserves exploration. Male runners of 50 years who have completed at least five marathon races during the preceding 3 years and do not suffer from coronary disease, angina nor diabetes mellitus are studied to assess the predictive value of established and modern imaging based and biochemical cardiovascualr risk factors. Laboratory parameters including clinical chemistry, hematology and hormone measurements are determined. Life style–related risk factors, psychosocial and socioeconomic variables are explored using standardized questionnaries. Coronary, carotid, femoral and aortic atherosclerosis is measured using
electron beam computed tomography and ultrasound. In addition, a resting ECG, a bicycle stress rest and heart rate variability are performed. Myocardial morphology and function are assessed using echocardiography and magnetic resonance imaging. Participants are invited to compete in a marathon race to quantify the association of coronary atherosclerosis with marathon–related changes of cardiac troponin levels and the extent of marathon–induced inflammation. At the cellular level, the effect on the amount of circulating progenitor cells (EPCS) is determined by FACS analysis. Changes in laboratory parameters and hormone levels are also studied. Annual long–term follow–up including hospital records and death certificates is performed. Data are compared with those from a general unselected cohort from the Heinz Nixdorf Recall Study.

Motonaga et al., (2006) The estimation of Total daily Energy Expenditure (TEE) or the energy needs of athletes is important for maintaining a proper energy balance during training. This study was conducted to measure the TEE of Japanese middle-and long-distance runners using a heart-rate monitoring method (the HR method), and to ascertain the impact of three key Energy Expenditure (EE) components occurring within the day: sleep, exercise (training) and inactivity (other daily habitual activities). Additionally, energy balance was evaluated by comparing TEE with Energy Intake (EI). The mean TEE of six male athletes aged 19-21 years was 4,514 +/- kcal/d and their mean EI was 3,784 +/- 91 kal/d during the training period of 11 d. This negative
energy balance led to significant decline in body weight (p<0.01) in the athletes. The of the endurance athletes was higher than expected and significantly affected by exercise EE, indicting that the TEE of athletes, in general, must be carefully evaluated before incorporating nutritional support for them.

Natraj et al., (2006) conducted a study on 61 junior Kabaddi players who had participated in the junior national championship. Motor ability variables taken for the study were strength, power, speed, cardiovascular endurance, agility and coordinative ability. Three specialists in the game determined the performance ability of the players, on a ten-point scale, following factors were observed for rating the players. They are: position play during defense, ability to held, ability to support, tactical ability, understanding with co-players, attacking ability, ability to score points penetration in attack, aggressive attack, tactics in attack, general behavior game, and team players. Pull-up, bent knee set-up, two arm medicine ball put, five double leg bounds. 30 meter run (standing start) 20 meter multi stage shuttle run, (20 MST) SEMO agility, backward medicine ball throw, and distance perception jump tests.

Palatini, et al., (2006) The four studies performed in hypertensive patients found a positive association between heart rate and all–cause mortality or cardiovascular mortality. In spite of this evidence, elevated heart rate remains a neglected cardiovascular risk factor in both genders. The pathogenetic mechanisms connecting high heart rate, hypertension,
atherosclerosis and cardiovascular events have also been elucidated in many studies. Several trails respectively showed the beneficial effect of cardiac-showing drugs, such as beta-blockers and non dihydropyridine calcium antagonists on mortality, notably in patients with coronary heart disease or heart failure, but no published data are available in patients with hypertension free of coronary heart disease or heart failure. Although it has not been proven in existing trails, it would seem reasonable to recommend in hypertensive subjects with heart rate > 80-85 b / min, antihypertensive agents that decrease the heart rate. The f-channel blockers, selective heart rate – lowering agents with no effect on blood pressure, could also profitably used in hypertensive subjects with fast heart rate.

Saunders et al., (2006) investigated a study on short–term plyometric training improves running economy in highly trained middle and long distance runners. Fifteen highly trained distance runners VO2 max 71.1 +/- 6.0 ml. min (-1). Kg(-1), mean +/- SD) were randomly assigned to a plyometric training (PLY;n=7) or control (CON;n=8) group. In addition to their normal training, the PLY group undertook 3 x 30 minutes PLY sessions per week for 9 weeks. Running Economy (RE) was assessed during 3 x 4 minutes treadmill runs (14, 16 and 18 km.h(-1)), followed by an incremental test to measure VO2max. Muscle power characteristics were assessed on a portable, unidirectional ground reaction force plate. Compared with CON, PLY improved RE at 18 km.h (-1) (4.1 %, p=0.02), but not at 14 to 16 km.h(-1). This was accompanied
by trends for increased average power during a 5 – jump plyometric test (15%, p=0.11), a shorter time to reach maximal dynamic strength during a strength quality assessment test (14 %, p=0.09), and a lower VO2 speed slope (14%, p=0.12) after 9 weeks of PLY. There were no significant differences in cardio respiratory measures of VO2 max as a result of PLY. In a group of highly-trained distance runners, 9 weeks of PLY improved RE, with likely mechanisms residing in the muscle, or alternatively by improving running mechanics.

**Sumi, et al., (2006)** Pulse rate study was demonstrated to conduct the transition of heart rate variability (HRV) during trails in the field and to examine the relationship between peak frequency of high-frequency bank (HF) and stride frequency. Ten healthy long-distance college female runners (age 19-21 years) performed a 3000m realistic time trial. The time series poser spectrum analysis by maximum entropy method was used to evaluate cardiac autonomic nervous activity during the race. Cross-correlation coefficients were calculated to estimate the degree of linear co-ordination between the central peak frequency of HF and stride frequency. Just after starting, the decrease in HF (0.15 – 1.00 Hz) and a transient increase of low-frequency bank (LF)/HF were found. After that, the HG remained at a low level and LF/HF decreased sharply. These findings suggested that the parasympathetic activity was suppressed and sympathetic activity increased just after starting. The sympathetic activity reached the saturated level according to continuation of
high intensity exercise. In spite of the significant decrease of HRV during trails, peak frequency of HF could be differentiated clearly. The cross correlation coefficient of peak frequency of HF and stride frequency was from 0.703 to 0.868. This finding indicated that exercise rhythm reflected HRV during high intensity running in the field.

Suresh Roy et al., (2006) assessed physiological characteristics of national–level male and female fencers of India and compare the results that of the fencers of other countries. 28 national-level fencers, out of which 12 were females who have represented the country, at least once, or participated and won at least a medal in the national or international level, were chosen. Body composition, pulmonary function and maximal aerobic poser were assessed with Tanita’s Body Composition Analyser, Spirolab–2, and motorized Treadmill machine at Sports Authority of India, North-East Regional Centre, Takyelpat, Imphal, Manipur, during the period of June 2005 to July 2005. The mean body weight and height of the male Indian fencers were significantly more than those of the female counterparts, but the mean fat percentage among the male Indian fencers were less than those of the female counterparts. In comparison with the International fencers, the weight and height of their Indian fencers were less than the fat percentage was more, among the Indian fencers. The respiratory variables and maximal aerobic power (VO2 max) were much higher among the male fencers than the females, but the VO2 max values were higher among the Indian fencers than the international counterparts.
Thomas Ruf et al., (2006) Polyunsaturated fatty acids (PUFAs) are important dietary components that mammals cannot synthesize de novo. Beneficial effects of PUFAs, in particular of the n-3 class, for certain aspects of animal and human health (e.g., cardiovascular function) are well known. Several observations suggest, however, that PUFAs may also affect the performance of skeletal muscles in vertebrates. For instance, it has been shown that experimentally n-6 PUFA-enriched diets increase the maximum swimming speed in salmon. Also, we recently found that the proportion of PUFAs in the muscle phospholipids of an extremely fast runner, the brown hare (Lepus europaeus), are very high compared to other mammals. Therefore, we predicted that locomotor performance, namely running speed, should be associated with differences in muscle fatty acid profiles. To test this hypothesis, we determined phospholipids fatty acid profiles in skeletal muscles of 36 mammalian species ranging from shrews to elephants. We found that there is indeed a general positive, surprisingly strong relation between the n-6 PUFAs content in muscle phospholipids and maximum running speed of mammals. This finding suggests that muscle fatty acid composition directly affects a highly fitness-relevant trait, which may be decisive for the ability of animals to escape from predators or catch prey.

Barzpuka et al., (2007) investigated the effect of simultaneous model observation and self–modeling of volleyball skill acquisition. 53 public 12 to 15 years old, formed two experimental groups and one control group who
followed an intervention program with 12 practice sessions for acquisition and retention of how to receive a ball. Groups received different types of feedback before and in the middle of each practice session. Reception performance outcome (score) and technique in every group were assessed before and at the end of the intervention program and during the retention phase. A3 (Group) x 3 (Measurement Period), multivariate analysis of variance with repeated measures was applied to investigate differences. Results showed equivalent improvement in all three groups at the end of the intervention programme. In conclusion, types of augmented feedback from the physical education teacher are effective in acquisition and retention of the skill for reception in volleyball.

**Ben Abdelkrim, et al., (2007)** The physical demands of modern basketball were assessed by investigating 38 elite under 19 year old basketball players during competition. Computerized time-motion analyses were performed on 18 players of various positions. Heart rate was recorded conitnuously for all subjects. Blood was sampled before the start of each match, at half time and as full to determine lactate concentration. Players spend 8.8 % (1%), 5.3%(0.8%) and 2.1% (0.3%) of live time in high “Specific movements”, sprinting and jumping, respectively. Centres spent significantly lower live time competing in high-intensity activities than guards 14.7% (1%) v 17.1% (1.2%); p<0.01) and forwards (16.6%(0.8%); p<0.05). The Mean Standard (SD) heart rate during total time was 171 (4) beats / min, with a significant difference (p<0.01) between guards and centers. Mean (SD) plasma
lactate concentration was 5.49 (1.24) mmol/l, with concentrations at half time (4.94 (1.46) mmol/l. The changes to the rules of basketball have slightly increased the cardiac efforts involved during competition. The game intensity may differ according to the playing position, being greatest in guards.

**Bosquet et al., (2007)** studied the subjects matched for but with differing aerobic endurance displayed similar Heart Rate Variability (HRV) at rest and Heart Rate Recovery (HRR) after maximal exercise. We hypothesized that the higher the aerobic endurance, the higher the HRV and the faster the HRR. Twenty-eight well trained middle and long-distance runners (24 men and 4 women) performed a maximal continuous graded exercise test for the determination of maximal oxygen consumption Ventilatory Threshold (VT), Peak Treadmill Velocity (PTV) and HRR, as well as a test to measure the automatic regulation of heart rate during supine rest, using HRV analysis. Once both tests were completed, subjects were matched for and assigned to the low endurance or the high endurance group, depending on the percentage of PTV at which VT occurred (81.9+/- 2.9 and 88.3+/-3.1 % PTV for both groups, respectively; p < 0.01). Contrary to our hypotheses, neither HRR parameters were different between groups or associated with aerobic endurance. These results suggest that aerobic endurance is not associated with cardiovascular autonomic control, as measured by HRV and HRR.

**Cooke et al., (2007)** velocity coupling denotes a perceptual motor behaviors known to occur during coincidence timing tasks, individuals have
been shown in to increase their effector’s limb speed with increase in stimulus speed during interceptive tasks. However little is known about the physiological effects of velocity coupling. The aim of this study was to determine the physiological cost of velocity coupling during tennis ground strokes. Eight male and eight female competitive tennis players volunteered to perform three 4–min bouts of continuous ground strokes against ball projected from tennis ball machine at speeds of 18, 22 and 27 m x s (–1) (65, 79 and 97 km x h(-1)) and a frequency of 14 balls per minute, the order of which was counterbalanced. Breath-by-breath pulmonary was exchange, heart rate, locomotion time, and limb acceleration were measured throughout each of 4–min bouts. Capillary blood samples (for blood lactate analysis), rating of perceived exertion, and difficulty rating were taken at the end of each bout. Increasing ball speed did not influence the locomotion time between ground strokes but did not result in a bilateral increase in both the mean upper – and lower limp acceleration (all p<0.05). It would appear, therefore, that velocity coupling during tennis ground strokes. Behaviour indirectly modified the concurrent cardiopulmonary and metabolic responses.

Dollman and Olds, (2007) There is accumulated evidence of work wide declines in Cardio Respiratory Endurance (CRE) among children. To date, few studies have focused on trends distributional characteristics of CRE performance. This study analysed 1985 and 1997 samples of Australian children on the 1.6 km run / walk test, using a variety of descriptive and
inferential statistics to compare distribution of average running speed among 10 to 11 years olds. The analysis was conducted on 965 boys and 935 girls from 1985, and 661 boys and 553 girls from 1997. Among the boys there is no significant increase in coefficient of variation of average completion times, with a marked decrease in negative skew. This was largely attributable to the largest declines according to the middle percentiles, with relatively smaller declines at low (<5th) and high (>90th) percentiles. The bulk of the scores have shifted towards the left side of the distribution, reducing the skew. Among the girls the distributional trends were different; there was little changes in ‘scatter’ and skew of test scores, with declines in performance being relatively uniform across the distribution. These findings contrast with previous report of greater declines among the lowest ranked performers on CRE tests. The observed declines in all percentiles other than the lowest and highest ranked boys suggest that mechanism for declining fitness are widespread throughout the population and may reflect changes in environmental barriers and enablers of regular physical activity among Australian youth.

Kovacs (2007) the game of tennis has evolved from the wooden-racket era of long, crafty points based on style and fitness, to the current fast paced, explosive sport based on power, strength and speed, where 210 lm/h serves are common. This evolution over the last 20 years has led an increased interest in tennis research. Competitive tennis athletes need a maximum of anaerobic
skill, such as speed and agility and power, combined with high aerobic capabilities. The work-to-rest ratios of competitive tennis athletes range between 1:3 and 1:5, and fatigue has been shown to greatly reduce the hitting accuracy. Competitive male tennis athletes maintain body fat < 12% and have maximal oxygen uptake value > 50mL/Kg/min, and as high as 70 mL/Kg/min. Results from lactate testing in tennis players are inconclusive as some studies have shown increased levels whilst other studies have shown little or no change. Further investigation is required to determine the production and utilization effects of lactate from playing tennis. The average length of time to play a point in tennis is < 10 seconds and this has declined substantially in the last 20 years. Further research is needed to investigate tournament performance and its effect on fatigue, recovery, hormonal and injury levels. As the game of tennis continues to change, the coaches and trainers with information that will aid in the development of efficient and productive tennis performance and injury prevention programmes by contributing their practical knowledge.

Lamb and Rogers, (2007) most studies that have set out to quantify the test-retest reliability of the Multi-Stage Shuttle Run Test (MSSRT) have typically used in appropriate statistics (correlation coefficients) and / or one of two possible calculation methods for deriving predictions of maximal oxygen uptake and have not considered the impact of habituation on performance in the MSSRT and whether its reliability improves the reliability of MSSRT over
three trails. Thirty-five health and active university games players (22 males and 13 females) performed the MSSRT on three occasions, one week apart. Individual total number of completed shuttles was recorded and estimated values were derived via established equation and table methods. Analysis revealed that the overall mean score from the equation method (52.5 +/- 7.8 ml kg(-1)) was significantly higher than that for the table (46.9 +/- 8.9 ml kg(-1)), whilst the mean trial 2 and 3 scores were significantly higher than that for trial 1, but not different to each other. The limits of Agreement for the table method were -1.4 +/- 5.0 (trial 1-trial 2) and 0.0 +/- 5.5 ml kg (-1) (trial 2-trial 3) and for the equation method -1.1 +/- 4.7(trial 1 – trial 2) and 0.0 +/- 5.5 ml kg (-1) (trial 2 – trial 3). These results suggest that systematic bias is eliminated after the first trial (due to habituation), but a considerable amount of random error remains, regardless of the type of score calculated. Hence, among out sample, the MSSRT does not appear to be reliable enough for the purpose of monitoring changes in due to non-random reasons.

Malina et al., (2007) evaluated the growth, maturity status and functional capacity of youth soccer players grouped by level of skill. The sample include 69 male players were measured and stage of Public Hair (PH) was assessed at clinical examination. Years of experience in football were obtained at interview. Three tests of functional capacity were administered: dash, vertical jump and endurance shuttle run. Performances on 6 soccer – specific tests were converted to a composite score which was used to classify
players into quintiles of skill. Multiple analysis of covariance, controlling for age, was used to test differences among skill groups in experience, growth status and functional capacity, whereas multiple linear regression analysis was used to test differences among skill groups in experience, growth status and functional capacity, whereas multiple linear regression analysis was used to estimate the relative contributions of age, years of training in soccer, stage of PH, height, body mass, the height x weight interaction and functional capacities to the composite skill score. The skill groups differed significantly in the intermittent endurance run (p < 0.05) but not in the other variables. Only the difference between the highest and lowest skill groups in the endurance shuttle run was significant. Most players in the highest (12 of 14) and high (11 of 14) skill groups were in the stage of PH 4 and PH 5. Pubertal status and height accounted for 21% of the variance in skill accounted for to 29%. In both regressions, the coefficient for height was negative. Adolescent soccer players aged 13-15 years classified by skill to not differ in age, experience, body size, speed and power, but differ in aerobic endurance, specifically at the extremes of skill. Stage of puberty and aerobic resistance (positive coefficients) and height (negative coefficient) are significant predictors of soccer skill (29% of the total explained variance), highlighting the inter-relationship of growth, maturity and functional characteristics of youth soccer players.

Marocolo et al., (2007) Increased Heart Rate Variability (HRV) and high – frequency content of the terminal region of the ventricular activation of
signal – averaged ECG (SAECG) have been reported of in athletes. The present study investigates HRV and SAECG and VO2 max were determined in 18 high performance long-distance (25+/−6 years; 17 males) runners 24h after a training session. Clinical visits, ECG and VO2 max determination were scheduled for all athletes during the training period. A group of 18 untrained healthy volunteers matched for age, gender, and body surface area was included as controls. SAECG was acquired in the resting supine position for 15 min and processed to extract average RR interval (Mean – RR) and Root Mean Squared Standard Deviation (RMSSD) of the difference of two consecutive normal RR intervals. SAECG variables analyses in the vector magnitude with 40 – 250 Hz band-pass bi-directional filtering were: total and 40-micro v verminal (LAS40) duration of ventricular activation, RMS voltage of total (RMST) and of the 40 mts terminal region of ventricular activation. Linear and multivariate step wide logistic regressions oriented by inter-group comparisons were adjusted in significant variables in order to predict VO2 max, with a p < 0.05 considered to be significant. VO2 max correlated significantly (p<0.05) with RMST (r=0.7), Mean – RR (r=0.62), RMSSD (r=-0.39). RMST was the independent predictor of VO2 max and the high – frequency components of the SAECG correlate with VO2 max and high-frequency continent of SAECG is an independent predictor of VO2 max.

Nayak et al., (2007) predicted the swim speed performance, on the basis of selected anthropometric characteristics, arm and leg speed, of thirty top class
Indian swimmers, randomly selected from the open national swimming competition, held at Talkatora Stadium, New Delhi. The standard testing procedures were applied to measure the performance of height, weight, leg length, arm length, body composition, arm speed, leg speed and 50 m swim speed performance. Initially, zero order co-relations were applied between the dependent variables and each selected independent variable. Further, multiple regression analysis was made, to find out prediction equation. The obtained prediction equation was as follows:

\[ X_c = 1.289 \times X_6 - 7395 \times X_7 - 0.385 \times X_8 + 65.05 \]

where as, \( X_c = 50 \text{m swim performance}, X_6 = \text{Arm speed}, X_7 = \text{leg speed} \) and \( X_8 = \text{body composition} \);

On the basis if zero–order, correlations, as well obtained prediction equation, it was concluded that the selected anthropometric characteristics have significant relationship to the 50m swim performance and the arm speed has a higher predictive value than the leg speed, in swim performance.

**Patrick et al., (2007)** assessed the effect of altitude on match results and physiological performance of large and diverse population of professional athletes. Statistical analysis of international football (soccer) scores and results). Data resource FIFA extensive database of 1460 football matches in 10 countries spanning over 100 years. Altitude had a significant \((P<0.001)\) negative impact on physiological performance as revealed through the overall underperformance of low altitude teams when playing against high altitude
teams in South America. High altitude teams score more and concede fewer goals with increasing altitude difference. Each additional 1000 m of altitude difference increases the goal difference by about half of a goal. The probability of the home team winning for two teams from the same altitude is 0.537, whereas this rises to 0.825 for a home team with an altitude difference of 3695 m (such as Bolivia v Brazil) and falls to 0.213 when the altitude difference is –3695 m (such as Brazil v Bolivia).

Patric and Steren (2007) observed an action activates the same representations as does the actual performance of the action. Here we show for the first time that the action system can also be activated in the complete absence of action perception. When the participants had to identify the faces of famous athletes, the responses were influenced by their similarity to the motor skills of the athletes. Thus, the motor skills of the viewed athletes were retrieved automatically during person identification and had a direct influence on the action system of the observer. However, our results also indicated that motor behaviours that are implicit characteristics of their people are represented differently from when actions are directly observed. That is, unlike the facilitatory effects reported when actions were seen, the embodiment of the motor behaviour that is not concurrently perceived gave rise to contrast effects where responses similar to the behaviour of the athletes were inhibited.

Peter HC Klign et al., (2007) Increasing activity levels in adolescents with obesity requires the development of exercise programs that are both
attractive to adolescents and easily reproducible. The aim of this study was to
develop a modular aerobic training program for adolescents with severe
obesity, with a focus on variety, individual targets and acquiring physical skills.
We report here the effects on aerobic fitness from a pilot study. Furthermore,
we examined the feasibility of the modified shuttle test (MST) as an outcome
parameter for aerobic fitness in adolescents with severe obesity.

Fifteen adolescents from an inpatient body weight management program
participated in the aerobic training study (age 14.7 ± 2.1 yrs, body mass index
37.4 ± 3.5). The subjects trained three days per week for 12 weeks, with each
session lasting 30-60 minutes. The modular training program consisted of
indoor, indoor and swimming activities. Feasibility of the MST was studied by
assessing construct validity, test-retest reliability and sensitivity to change.

Comparing pertaining and end of training period showed large clinically
relevant and significant improvements for all aerobic indices; e.g. VO (r=0.79)
and W (r=0.84) but not with anthropometric measures. The MST walking
distance improved significantly by 32.5%, ES 2.5. The attendance rate at the
exercise sessions was excellent.

Post, et al., (2007) conducted a research regarding the association of
mechanical principles involved in swinging movement patterns of players. In
mechanical studies of pumping a playground swing, two methods of energy
insertion have been identified: parametric pumping and driven oscillation.
While parametric pumping involves the systematic raising and lowering of the
swinger’s Center of Mass (CM) along the swing’s radial axis (rope), driven oscillation may be conceived as rotation of the CM around a pivot appointed at a fixed distance to the point of suspension. We examined the relative contributions of those two methods of energy insertion by inviting 18 participants to pump a swing from standstill and by measuring and analyzing the swing – swinger system (defined by eight markers) in the sagittal plane. Overall, driven oscillation was found to play a major role and parametric pumping a subordinate role, although the relative contribution of driven oscillation decreased as swinging amplitude increased, whereas that of parametric pumping increased slightly. Principal component analysis revealed that the coordination pattern of the swing – swinger system was largely determined (up to 95 %) by the swing’s motion, while correlation analysis revealed that (within the remaining 5% of variance) trunk and leg rotations were strongly coupled.

Reis et al., (2007) did a comparative study on oxygen uptake (VO2), Slow Component (SC) during level and uphill running in endurance runners, and to identify associations between the SC and the following fitness indicators: peak VO2, running speed associated with the pea VO2 (V peak), running speed at the lactic threshold and the VO2 fraction elicited at the lactic threshold. Fourteen male endurance-trained runners underwent several 6 – min bouts of level (LTR) and 10.5% uphill treadmill running. VO2 SC was calculated as the difference between mean VO2 during the 6th and 3rd minutes.
The highest mean values for the SC were 181.9 +/- 2402 ml x min (-1) for level running at 94 % peak VO2 and the V peak (-0.71 and –0.76, p<0.05, respectively). The results show that for endurance trained runners the magnitude of the SC is not affected by the treadmill gradient and that within an homogeneous sample of endurance – trained runners the SC does not correlate with indicators of aerobic fitness.