

CHAPTER II

REVIEW OF RELATED LITERATURE

Generally, development of norms for Selection of football players in school requires consideration of many human as well as environmental factors. Along with judging the skill performance of a football players, associated psycho-psychological, morphological and fitness factor also to be looked upon.

To get clear cut idea of selecting associated factors of a talented football player, ample of literature have been reviewed in this chapter. The detailed reviews have been classified as follows:

Review of related literature will be done in following major areas.

1. Studies on football research.
2. Studies on health related physical fitness.
3. Studies on development of test and norms.
4. Articles.

Researches in the above mentioned areas.

Wisloff, U., Helgerud, J. & Hoff, J. (1998) ¹ Strength and endurance of elite soccer players. The major purpose of the present study was to examine whether there exists a

relationship between preseason physiological tests and performance results in the soccer league. Further, it investigated maximal oxygen uptake and maximal strength in proportion to body mass for soccer players. A secondary aim was to establish some normative data of Norwegian elite soccer players. Methods: Two teams from the Norwegian elite soccer league participated in the study.

Results/Conclusion: The present study supports previous investigations indicating a positive relationship between maximal aerobic capacity, physical strength, and performance results in the elite soccer league. It is concluded that for soccer players, maximal oxygen uptake should be expressed in relation to body mass raised to the power of 0.75 and maximal strength in relation to body mass raised to the power of 0.67, when the aim is to evaluate maximal aerobic capacity when running and strength capacity among players with different body mass. Midfield players had significantly higher maximal oxygen uptake compared with defense players using the traditional expression, $\text{mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$, while no significant differences were found expressing maximal oxygen uptake either absolutely ($\text{L}\cdot\text{min}^{-1}$) or in relation to body mass raised to the power of 0.75 ($\text{mL}\cdot\text{kg}^{-0.75}\cdot\text{min}^{-1}$) among players grouped by position. There was a significant correlation ($r = 0.61$, $P < 0.01$) between squat IRM

and vertical jump height. Vertical jump heights for defense and forward players were significantly higher compared with midfield players. Mean results from the laboratory test were $63.7 \text{ mL.kg}^{-1}.\text{min}^{-1}$ or $188.6 \text{ mL.kg}^{-0.75}.\text{min}^{-1}$ for maximal oxygen uptake, 150 kg or $8.0 \text{ kg.m}_b^{0.67}$ for 90° squats, 79.9 kg or $4.4 \text{ kg.m}_b^{-0.67}$ for bench press. Mean values of vertical jump height were 54.9 cm.

Davids, K., Lees, A. & Burwitz, L. (2000) ² Understanding and measuring coordination and control in kicking skills in soccer: Implications for talent identification and skill acquisition. In this review, we explore the role of motor control and biomechanics in developing an understanding of soccer skills using kicking as the main vehicle. The links between these sub-disciplines of sport science have not been well established in the past because of an emphasis on cognitive processes in traditional accounts of motor behavior. We argue that a dynamical systems interpretation of the processes of coordination and control in movements with multiple degrees of freedom signals a new era in the relationship between the sub-disciplines of motor control and biomechanics. Although research on coordination and control of soccer skills is currently sparse, there are indications that the relationship between motor control and biomechanics could form a significant component of scientific programmes in

talent identification and skill development. Further interdisciplinary work is needed to enhance understanding of coordination and control of soccer skills.

Sérgio, T. da F., Juliana, M. O., Paula, L. P., Raquel, S. B., Christiano, A. C. and Letícia, L. W. (2007)³. Characterization of professional soccer players' muscle performance the association of muscular performance with risk of injury and functional performance in different sports has been reported in numerous studies in the literature. However, there is a paucity of data that characterizes the muscular performance in Brazilian professional soccer athletes. Therefore, the objective of this study was to make a descriptive analysis of parameters related to the muscular performance of this population.

Mehrez, A. & Michael, Y. Hu. (1995)⁴ A basic normative approach is suggested to evaluate a family of predictors of the outcome of a soccer game. The proposed approach can be easily extended to cover any sports games. Members of the family such as the naive and mode predictors are evaluated and their relative efficiencies are derived. Furthermore, a statistical analysis regarding these predictors is supplied to identify the

factors affecting the outcomes of games in the Israeli Soccer League.

Shinde A.F. (2005)⁵ prepared Standardization of Norms for Health Related Physical Fitness of First year College Student, in this study total 12075 college going male student are taken as a subject from different colleges of Marathwada University. The purpose of study was to standardize norms for health related physical. Selected test item are used for this study, 12 Min. Run walk, Sit-ups, Grip strength, Body fat (Omron machine), Height and Weight for BMI, Sit & Rich.

Beckford (1976)⁶ conducted a study to evaluate the physical fitness level of Navajo girls 14 to 16 years old. AAHPER youth fitness test was administered on the subjects selected from seven school of the region to measure the physical fitness level. Also norms were established on basis of sources obtained from test result from these school.

Singh (1988)⁷ Undertook a normative study of the physical fitness of male teenagers of the state of Jammu and Kashmir in the ages 13 through 19 years. The variables considered were, Pull-ups (arm and shoulder girdle strength), bent knee sit-ups

(abdomen strength), standing broad jump (explosive strength), 50 meter dash (speed), Shuttle run (agility), and 600 meters run-walk (cardiovascular endurance). He concluded that the subjects belonging to the age group 16 through 19 years showed better performance in all variable over the other age group of 13 through 15 years.

Zuti and Corbin (1977)⁸ conduct a research on physical fitness norms for college freshmen. They took 3000 freshmen of Kansas state university with the age of 17.6 to 19.5 years. Test were conducted for strength test, flexibility, body composition, cardiovascular fitness. The result appear to indicate that the college freshmen at Kansas state university were above average and the standards were appropriate for their use at National level.

Folkins and Sims (1981)⁹ studied the effect of physical fitness training upon mental health. Their research suggested that physical fitness training leads to improved mood, self-concept and work behaviour; the evidence is less clear as to its effects on cognitive function, although it does appear to bolster cognitive performance during and after physical stress. They also noted that except for self-concept, personality traits are

not affected by improvements in 'physical fitness. However, mentally retarded children demonstrate psychological improvement following physical fitness training, but no conclusion can be reached regarding the effects of physical fitness training with other clinical syndromes.

Kumar Dinesh (1998)¹⁰ the main purpose of the study was to evolve physical fitness norms on various items of Freshman's fitness battery for high and higher secondary school boys of Himachal and also the physical fitness level of the secondary school male student of Himachal Pradesh. To accomplish the study 3840 student between the age group of 13 to 16 years were randomly selected from both the urban and rural area. The result have shown that their was significant difference from 15 years to 16 years male subjects of Himachal Pradesh in almost all fitness components. The boys of 16 years were found significantly superior than 15 years to 13 years boys. The 15 years boys were better than 14 and 13 years boys. Similarly 14 years boys were superior to 13 year boys I n all the components of Freshman's test battery. The result of the study have also shown that the male subjects in six of ten fitness components of Freshman's test battery.

Morgan (1981)¹¹ attempted to identify affective beneficence of vigorous physical activity. His research revealed that well increased in self-esteem and vigorous exercise is associated with a sensation of well-being and this subjective state has been objectively quantified with psychometric cardiac, vascular and neurophysiological data. Reductions in state anxiety have been demonstrated to follow acute physical activity and this response persists for 2-5 hr. Regular physical activity has been associated with reductions in anxiety and depression.

Brake and Bornholt (2002)¹² raised important issues for educators that are useful in motivating children to participate in physical activities. The focus was on children's feelings and self-evaluations about physical movement, in relation to the body and appearance, as well as social aspects of friendship, belonging, individuality and self-expression. The study presents case studies of six children aged from 7 to 9 years. Results show generally positive attitudes and particular areas of confidence help for optimal physical self-concepts for each child. The implications are for how teachers can optimize children's self-concepts and motivation to participate in physical activities.

Gill and Chouhan (1989)¹³ investigated the effect of Four-week intensive training in Physical education activities on self-concept of 64 Tribal males, studying in secondary schools of different tribal districts of Maharashtra state namely, Chandrapur, Yeotmal, Nagpur and Amaravati. Self-concept was measured at the beginning and at the end of the training camp by administering Sherry *et al's* test. Their results revealed that participation in a programme had a positive effect on the overall self-concept of the Tribal students. However, the dimension wise analysis revealed that temperamental qualities, academic status, intellectual abilities emotional tendencies, mental health and socio-economic status were remained un-effected by the 4 weeks training programme. Hence they concluded that only health and physique and habits and behavior dimensions of self-concept had positive effect of physical activities programme.

Kangane S.E.(2004)¹⁴ Development and Standardization of test battery for the selection of Junior Hand Ball players of Maharashtra, in this study total 600 male students are taken as a subject from Maharashtra. The purpose of study was to develop and standardize test battery for selection of junior handball players of Maharashtra. Selected test item are used for this study, 12 min. Run walk test, Sit-ups, Push-ups, Handgrip, Shuttle run, Vertical jump, 50 mtr. Dash, Sit & Rich, Height,

Weight, Fat %, Fat mass, BMI, H.R., B.P., P.E.F.R., R.R, Skill test of Handball.

Satya Paul Kumar P.P.(1992)¹⁵ Development of Norms to Selection of Volleyball Players of Nagarjuna University, in this study total 13 team from different colleges of Nagarjuna University. Total 127 male students of below 25 years old are taken as a subject. The purpose of study was to develop norms for selection of team. Selected test item are used for this study, 4 X 10 mt. Shuttle run, Standing Broad Jump, Vertical jump, 50-mt. Dash, Height (cm), Weight (kg), Volleyball skill test.

Wangwad V.S. (1985)¹⁶ Development of Norms for Selection of Volleyball Players in Maharashtra, in this study total 20 team from different District of Maharashtra state. Total 272 male students of below 18 years old are taken as a subject. The purpose of study was to develop norms for selection of team. Selected test item are used for this study, for Physical Structure: Height (cm), Weight (kg), Skinfolds, & Body types, for Fitness component: Speed, Agility, Flexibility, Balance, Jumping ability & Coordination, And for Volley ball skills: Upper hand pass, Under hand pass, Service & Reception, Set up & smash.

Hoffman, J. (2006)¹⁷. Norms for Fitness, Performance, and Health. Norms for Fitness, Performance, and Health contains a comprehensive collection of normative data for numerous fitness, performance, and health components across a range of ages, abilities, occupations, and athletic backgrounds. It lays the foundation for working with normative data by detailing the purpose and benefits of norms. It reviews relevant statistical information to assist the reader in understanding and interpreting descriptive statistics, including a limited discussion on inferential statistics.

Frey, G. C., Chow, B. (2006)¹⁸. Relationship between BMI, physical fitness, and motor skills in youth with mild intellectual disabilities. The negative impact of obesity on physical fitness and motor abilities has been documented in youth of various ages; however, this issue has not been explored in youth with mild intellectual disabilities (ID). Youth with ID are considered more overweight, less physically fit, and less motor proficient than peers without ID, so it is important to determine if these variables are associated in this population. The purpose of this study was to examine the relationship between body mass index (BMI), physical fitness, and motor skills in a large sample of

youth with mild ID. Method: A systematic, stratified sampling method was used to select 444 youth with mild ID, aged 6–18 years, from eight special education schools in Hong Kong. Physical fitness was assessed using items from the national Hong Kong assessment: 6- (ages 6–8 years) or 9- (ages 9–18 years) minute run, sit-up, isometric push-up, sit and reach, and sum of skin fold. Functional motor skills were assessed in 244 youth from the fitness sample using the Test of Gross Motor Development-II. Subjects were categorized into normal or overweight[[sol]]obese BMI groups based on international cutoff points.

Huang, Y. C., Malina, R. M. (2007)¹⁹. BMI and health-related physical fitness in Taiwanese youth 9-18 years. The purpose of the study was to evaluate the cross-sectional relationship between BMI and a physical fitness index (PFI) based on four indicators of fitness in a national sample of Taiwanese youth. Methods: Height, weight, and four measures of physical fitness (sit-ups completed in 60 s, standing long jump, sit and reach, and 800- or 1600-m run/ walk) were measured in a national sample of 102,765 Taiwanese youth 9-18 yr of age: 50,940 girls and 51,825 boys. BMI was calculated for each subject. Within each sex-specific half-year age group, students were classified

into five BMI categories based on national percentiles: very low, BMI < 5th percentile; low, BMI \geq 5th but < 15th percentiles; normal, BMI > 15th but < 85th percentiles; high, BMI \geq 85th but < 95th percentiles; and very high, BMI \geq 95th percentiles. Z-scores based on sex- and age-specific means and standard deviations were calculated, and the sum of z-scores for the four fitness tests was used as a PFI. Differences in PFI between BMI categories within each sex-specific half-year age group were compared with ANOVA with Bonferroni adjustments. Sex-specific regressions of PFI on BMI, using a nonlinear quadratic model, were done in four broader age categories. Relationships between BMI and PFI are nonlinear and vary with age from late childhood through adolescence. With increasing age during adolescence, the relationship becomes parabolic, and the peaks of the parabola are sharper in adolescent boys than girls. Conclusion: PFI declines in a curvilinear manner with increasing BMI among youth 9-18 yr of age, but the slope of the relationship varies with age.

Hands, B., Larkin, D., Parker, H., Straker, L., Perry, M. (2008)²⁰.

The relationship among physical activity, motor competence and health-related fitness in 14-year-old adolescents. Physical activity, physical fitness and motor competence are important

health-related constructs. However, the relationship among them, particularly for children and adolescents, is still unclear. In this study, motor competence (measured by the McCarron Assessment of Neuromuscular Development), pedometer-determined physical activity and physical fitness (aerobic fitness, muscle strength, muscle endurance, flexibility and body composition) were examined in a cohort of 1585 adolescents (771 girls, 814 boys) of mean age 14.06 years. Significant gender differences were observed for all measures except motor competence. Apart from hip and shoulder flexibility, males outperformed females. For both males and females, motor competence was associated with all fitness measures, physical activity was associated only with aerobic fitness and aerobic fitness was associated with physical activity, motor competence, BMI and chest pass. Among males, aerobic fitness was also associated with all other fitness tests. The correlations were, in general, moderate to weak. The results challenge the current focus on physical activity rather than physical fitness as the preferred intervention.

Joseph, P., Garry, M. D., John, J., McShane, M. D. (2002)²¹. Analysis of Lipoproteins and Body Mass Index in Professional Football Players. Exercise is known to improve lipoprotein

levels, whereas an elevated body mass index (BMI) is associated with less favorable lipoprotein levels. To date, there have been no reports of lipid analyses in elite athletes who also have BMIs in ranges considered unhealthful. The purpose of this study was to evaluate the lipid-lipoprotein profiles in a group of professional football players and to determine what association exists between these profiles and the players' BMIs. An observational study was conducted of 70 professional football players from one National Football League team. Measurements included BMI ($\text{kg}\cdot\text{m}^{-2}$), and fasting serum lipid analysis. BMI and position played were found to correlate ($p<0.001$), with linemen having the highest mean BMI, $38.1 \text{ kg}\cdot\text{m}^{-2}$. Comparing mean lipid values among BMI categories demonstrated lower high-density lipoprotein cholesterol levels ($p<0.01$), higher triglycerides ($p<0.05$), and higher total cholesterol/high-density lipoprotein cholesterol ratios ($p<0.001$) with an increasing BMI. Among the professional football players studied, a lower BMI was associated with a more favorable lipid-lipoprotein profile. Among the elite athletes in this study with the highest BMIs, exercise may not confer the same protective benefits on cardiovascular risk as it does in those athletes with normal BMIs.

Luis A M., Juan F. L., Ruth, S., María, I. M., Jesús, F.(2004)²².
Body composition in young male football (soccer) players. The aim of the study was to assess body composition by anthropometry in school-age children playing football (soccer) and to compare the results with those of a reference group. We studied 239 children aged 9.0 to 14.9 years who played this sport in a local league. We compared them with a reference population of 453 children in the same age range. We measured weight, height, four skinfold thicknesses, and two circumferences; and we calculated body mass index, total body fat percentage, fat free mass, arm fat percentage, and arm muscle area. Body mass index do not showed any significant difference between football (soccer) and reference groups in any age category. The percentage of total body fat was significantly lower in the football (soccer) group than in the reference group at 9, 11, 12, and 14 years. In studies aiming to assess the effect of physical activity on body composition, it will be necessary to measure, not only body mass index, but other measures of the body fat compartment. Football (soccer) can be proposed as a physical activity practice aiming to prevent or treat obesity and its comorbidities.

Cerizza, C., Menchise, C., Campanini, E. (2007)²³ Overweight and obesity in a sample of young soccer players undergoing the

first preparticipation physical examination. Nowadays, there is an increasing awareness about the prevalence of overweight and obesity among young people in industrialized countries. During the first preparticipation physical examination we measured the BMI of 238 male soccer players (mean age, 11.85 ± 0.66 years). The mean BMI was 19.36 ± 3.01 kg/m². Considering the total of the athletes included, 74(31%) had a BMI >20.55 (cut-off value for overweight at the age of 11 years), while 9(3.78%) had a BMI >25.10 (cut-off for obesity at the age of 11 years). Stratifying the subjects by age, 72(26.3%) of the 11 year-old-boys were overweight and, 2(10%) were obese. In 12 year-old-boys (129), 24% were overweight while 4 (12.9%) were obese. In 13 year-old-boys (37), 32.4% were overweight and 1 (8.3%) was obese. In conclusion, our data confirm the prevalence of overweight and obesity even in a group of active young soccer player boys and confirm also the importance of the preparticipation physical evaluation in detecting risk factors potentially linked with severe diseases in adult life.

Article: To evaluate the growth, maturity status and functional capacity of youth soccer players grouped by level of skill²⁴. Adolescent soccer players aged 13–15 years classified by skill do 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.

Article: The present study explored relationships between Psychological skills, self-efficacy, and performance among soccer players participating in the Amputee World Cup. Players completed the Test of Performance Strategies (Thomas, Hardy, & Nelson, 1999)²⁵. One hour before competition, participants completed a two-item self-efficacy measure designed to assess confidence in attaining performance goals for each competition. Participants completed a two-item self-referenced performance measure within an hour of competition. Results indicated self-efficacy showed reciprocal relationships with performance. Several psychological skills related to self-efficacy and performance. Relaxation skills used in training and competition were associated with high self-efficacy and successful performance. Future research should investigate the effectiveness of applied sport psychology interventions designed

to enhance self-efficacy through increasing the usage of psychological skills in training and competition.

Article: It has been suggested that applied sport psychology interventions should be founded on a basis of theory and research (Hardy, Jones, & Gould, 1996)²⁶; (Murphy & Tammen, 1998)²⁷; Lane & Terry, 2000)²⁸. A great deal of research effort has concentrated on attempting to predict performance from psychological variables. Evidence showing relationships between psychological variables could be used to guide sport psychology interventions, and it has been proposed that sport psychologists can enhance performance by enhancing psychological skills.

Article: The present study focuses on the relationship between rated psychological skills, self-efficacy measures, and perceptions of soccer performance among a soccer team playing at the Amputee World Cup. One variable shown to influence performance is self-efficacy. Self-efficacy is defined as the beliefs of confidence individuals have in their ability to execute courses of action or attain specific performance outcomes (Bandura, 1977, 1982, 1997)^{29,30,31}. Efficacy expectations are proposed to influence initiating behavior, how

much effort will be applied to attain an outcome, and the level of persistence applied to the task in the face of difficulties and setbacks. Examination of self-efficacy theory suggests that efficacy expectations are associated with successful performance (Moritz, Feltz, Fahrback, & Mack, 2000)³². Variations in self-efficacy-performance relationships have been ascribed to methodological inconsistencies between studies rather than challenging theoretical assumptions (Moritz et al., 2000). The way self-efficacy is measured has been found to influence the strength of self-efficacy-performance relationships. Moritz et al. (2000) demonstrated that weaker self-efficacy-performance relationships were evident when self-efficacy was measured using general measures of confidence such as the Competitive Sport.

Article: A multidisciplinary approach to talent identification in soccer³³. The requirements for soccer play are multifactorial and distinguishing characteristics of elite players can be investigated using multivariate analysis. The aim of the present study was to apply a comprehensive test battery to young players with a view to distinguishing between elite and sub-elite groups on the basis of performance on test items. Thirty-one (16 elite, 15 sub-elite) young players matched for chronological age (15-16 years) and

body size were studied. Test items included anthropometrics (n = 15), physiological (n = 8), psychological (n = 3) and soccer-specific skills (n = 2) tests. Variables were split into separate groups according to somatotype, body composition, body size, speed, endurance, performance measures, technical skill, anticipation, anxiety and task and ego orientation for purposes of univariate and multivariate analysis of variance and stepwise discriminate function analysis. The most discriminating of the measures were agility, sprint time, ego orientation and anticipation skill. The elite players were also significantly leaner, possessed more aerobic power (9.0 ± 1.7 vs 55.5 ± 3.8 ml·kg⁻¹·min⁻¹) and were more tolerant of fatigue (P < 0.05). They were also better at dribbling the ball, but not shooting. We conclude that the test battery used may be useful in establishing baseline reference data for young players being selected onto specialized development programmes.

Keywords: Anthropometrics; Physiology; Psychology; Technical; Skill.

Article: Match performance of high-standard soccer players with special reference to development of fatigue³⁴. The aim of this study was to assess physical fitness, match performance

and development of fatigue during competitive matches at two high standards of professional soccer.

Article: Predictors of the Outcome of a Soccer Game – a Normative Analysis Illustrated for the Israeli Soccer League

Traditional methods for quantifying sport performances are limited in their capacity to describe the complex interactions of events that occur within a performance over time. The following article outlines a new approach to the study of actions between players in team sports-mainly, soccer. Since the observational design is nomothetic, point, and multidimensional, an observational and data-collecting instrument has been developed. The instrument is mixed and combines a field format with a category system for game events, as well as an ad hoc instrument that considers the game actions of one or both teams, each recorded according to the same criteria

Article: Predicting dropout in male youth soccer using the theory of planned behavior³⁵. This investigation prospectively predicted dropout among young soccer players, using the theory of planned behavior (TPB). First, behavioral beliefs required to develop a TPB-questionnaire were elicited from 53 male soccer players, aged 13–15 years. Second, at the beginning of the

soccer season, 354 different male soccer players aged 13–15 years completed this questionnaire, thereby assessing direct dimensions (intention, attitude, subjective norm, perceived control) and indirect dimensions (attitudinal, normative and control beliefs) derived from TPB. Nine months later – upon termination of the soccer season – these players were classified into 323 perseverers and 31 dropouts, with TPB being applied prospectively to predict these two groups. For both direct and indirect dimensions, between-group comparisons revealed significant differences in favor of the perseverers. Discriminate analyses revealed five measures (intention, attitude, subjective norm, a normative belief, and a control belief), which enabled a 22.1% a priori dropout prediction when used within a suitable equation. In conclusion, TPB may have a promising application to prospectively discriminate dropouts from perseverers, providing a potential predictive a priori classification model for sport participation.

Article: Application of MRI of the wrist for age determination in international U-17 soccer competitions³⁶. To guarantee equal chances for different age groups, age-related tournaments for male and female players have been established in soccer. However, as registration at birth is not compulsory in some

countries, other methods of age determination are needed to prevent participation in the incorrect age group. Objectives: To evaluate the age of soccer players of international U-17 competitions from the degree of fusion of the distal radius and to compare the findings with an age-related normative population.

Article: Physiological adaptations to soccer specific endurance training in professional youth soccer players³⁷. Background: Improved oxygen uptake improves soccer performance as regards distance covered, involvements with the ball, and number of sprints. Large improvements in oxygen uptake have been shown using interval running. A similar physiological load arising from interval running could be obtained using the soccer ball in training. Objectives: The main aim was to study physiological adaptations to a 10 week high intensity aerobic interval training program performed by professional youth soccer players, using a soccer specific ball dribbling track.

Article: Aerobic endurance training improves soccer performance³⁸. The aim of the present study was to study the effects of aerobic training on performance during soccer match and soccer specific tests. Conclusion: Enhanced aerobic endurance in soccer players improved soccer performance by

increasing the distance covered, enhancing work intensity, and increasing the number of sprints and involvements with the ball during a match.

Article: Comparison of Various Exercise Tests with Endurance Performance during Soccer in Professional Players³⁹. To evaluate exercise procedures to test the endurance capacity during soccer, individual results in laboratory and field tests were compared to physical Performance during the match and further to Performance during long term, intermittent exercise. Twenty professional soccer players were video-taped during competitive soccer matches, and the longest total distance (match-distance) and high intensity distance were determined.

Article: Science and football: a review of applied research in the football codes⁴⁰. Over the last two decades there has been a growth in research directly related to football. Although most of this research is focused on soccer (association football), there has been a steady increase in publications related to the other football codes. There is evidence of more systematic training and selection influencing the anthropometric profiles of players who compete at the highest level. Fitness is being optimized to cope with match demands while accommodating the need for

specific requirements of positional roles. There is evidence of work rate being higher in contemporary football games than in previous decades, with consequences for training and dietary practices. Notation analysis of actions during matches is now used regularly to provide detailed objective feedback on performance to players and coaches. Training regimens are designed for game-specific purposes where possible. Sports psychologists working in a football context have a more eclectic body of knowledge to draw from. In the professional soccer clubs, the rewards associated with a successful investment in youth academies have helped to focus attention on talent identification and development models. It is a challenge to those specializing in science and football to contribute to the success of such schemes.

Article: Training and testing physical capacities for elite soccer players⁴¹. Elite soccer players spend a substantial amount of time trying to improve physical capacities, including aerobic endurance and strength and the strength derivatives of speed and power. The average oxygen uptake for international soccer teams ranges from 55 to 68 ml·kg⁻¹·min⁻¹ and the half-squat maximal strength from 120 to 180 kg. These values are similar to those found in other team sports. Recently, it has been

shown that the heart's stroke volume is the element in the oxygen chain that mainly limits aerobic endurance for athletes. These findings have given rise to more intensive training interventions to secure high stroke volumes, which, in turn, have proved positive in changing both maximal oxygen consumption and soccer performance in terms of distance covered, contacts with the ball and number of sprints in a game. The training employed has consisted of 4 × 4-min “intervals” running uphill at 90%–95% of maximal heart rate interspersed with 3-min jogging at 70% of maximal heart rate to facilitate removal of lactate. Research has revealed that a soccer-specific training routine with the ball might be as effective as plain running. Strength training to produce neural adaptations has been effective in changing not only strength in terms of “one-repetition maximum”, but also sprinting velocity and jumping height, in elite soccer players without any change in body mass. The same training has also improved running economy and thus aerobic endurance performance. The training regimen used for a European Champions League team was 4 × 4 repetitions of half-squats with the emphasis on maximal mobilization of force in the concentric action.

Article: Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players⁴². A high level of strength is inherent in elite soccer play, but the relation between maximal strength and sprint and jumping performance has not been studied thoroughly. Objective: To determine whether maximal strength correlates with sprint and vertical jump height in elite male soccer players.

Article: Normative Profiles of Sports Performance⁴³. Performance indicators in sport are not stable properties of individual competitors or teams and a single athlete's (or team's) performance will vary from match to match. For this reason, Hughes, Evans and Wells (2001) developed a technique for determining "normative profiles in performance analysis". This paper proposes an alternative technique that represents not only the typical performance of a team or individual but also the spread of performances. The technique also relates the set of performance indicators for a team or individual to normative data for a relevant population of teams or individuals. This provides a useful means of interpreting sports performance data. Grand Slam singles tennis is used as an example of the application of the proposed technique for determining a normative profile of a team's or individual's performance. It is recognized that the

mean value for each performance indicator within the typical performance is critically important information that should be supported by rather than replaced by percentile bandings.

Article: The influence of team norms on the cohesion–self-reported performance relationship: a multi-level analysis⁴⁴. To examine the potential moderating influence of team norms on the cohesion–self-reported performance relationship. Hierarchical linear modeling was used to (1) assess the individual- and group-level variability in self-reported performance, and (2) predict the variability in self-reported performance using three group-level predictors: cohesion, norms, interaction between cohesion and norms. The sample—298 athletes (112 male, 186 female) from 24 university and club level interactive and coactive sport teams-completed the Team Norm Questionnaire, the Group Environment Questionnaire, and Rating of Perceived Exertion Scale in relation to competitions, practices, and the off-season training.

Article: Specific fitness training and testing in competitive sports⁴⁵.

Improvements of athletic capacity in high-performance sport are mainly achieved through an increase of the quality of training. In

physical preparation, the quality of training can be improved by developing highly specific means of training. The aim of this paper is to present three examples of how highly specific means of fitness training of world class athletes can be developed. The first example presents a test profile of specific motor abilities of top class tennis players, the second one deals with the improvement of specific strength training methods for ski jumpers, and the third deals with the development of specific training devices of Alpine ski racers.

Article: Effect of motivational climate on sportsperson-ship among competitive youth male and female football players (Blake W. Miller, Glyn C. Roberts, Norwegian University of Sport Science, Oslo, Norway) ⁴⁶ The purpose of this study was to investigate the influence of perceived motivational climate and gender on sportsperson-ship behavior of competitive youth football players. Participants were 512 boy and 202 girl Norwegian youth football players (12–14 years old) competing in an international football tournament. A 2×2×2 (gender, mastery climate high and low, performance climate high and low) MANOVA produced no multivariate or interaction effects, but main effects for gender, performance climate, and mastery climate did emerge. *Post hoc* analyses of the simple main

effects found that boys and girls were different in sportsperson-ship, but only in that boys were more sportsperson-like than girls on one of the four sportsperson-ship dimensions. Players perceiving a high mastery climate endorsed sportsperson-ship more than those players perceiving a low mastery climate, and players perceiving a high performance climate were less likely to endorse sportsperson-ship than players perceiving a low performance climate. Canonical correlation analysis revealed that a strong mastery climate was positively associated with commitment, respect for social conventions, and respect for rules and officials. A strong performance climate was negatively associated with respect and concern for social conventions and respect for rules and officials, while a positive association emerged for respect and concern for the opponent. The results of our study suggest that both boys and girls may well perceive the coach emphasizing similar criteria of success and failure and thereby a similar culture of sportsperson-ship, while in general a strong mastery climate leads to a higher sportsperson-ship orientation.

Investigator's Criticism

From the review of the literature presented above it is seen that more attempts were made to develop the norms of Physical fitness. Although the above literature indicates that

limited work has been done on the anthropometric variable and skills of Particular sport, normative study standardizing any “selection Criteria” of football game is meager, specially, in India (Maharashtra) specifically in Pune such studies are absent in most of the games in general and the football game in particular. It was therefore, thought desirable to take up the present study.

Reference

1. Wisloff, U., Helgerud, J., & Hoff, J. (1998). Strength and endurance of elite soccer players, *Medicine and science in sports and exercise*, 30, 462 - 467.
2. Davids, K., Lees, A., & Burwitz, L. (2000). Understanding and measuring coordination and control in kicking skills in soccer: Implications for talent identification and skill acquisition. *Journal of Sports Sciences*, 18, 703 - 714.
3. Sérgio, T. da F., Juliana, M. O., Paula, L. P., Raquel, S. B., Christiano, A. C., and Letícia, L. W. (2007). Characterization of professional soccer players' muscle performance. *Rev Bras Med Esporte*, 13, 143 - 147.
4. Mehrez, A., & Michael, Y. Hu (1995). Predictors of the Outcome of a Soccer Game – a Normative Analysis Illustrated for the Israeli Soccer League. *ZOR Mathematical Methods of Operations Research*, 42, 361 - 372.
5. Shinde, A. F. (2005). *Prepared Standardization of Norms for Health Related Physical Fitness of First year College Student*, Unpublished Doctoral thesis, Marathwada University, Marathwada.
6. Beckford, P.A. (1979). *A normative study of the physical fitness of 14, 15 and 16 years old Navajo girls using*

AAPHER youth fitness test. Completed research in health, Physical education and Recreation, 159.

7. Singh, P. (1988). *Undertook a normative study of the physical fitness of male teenagers of the state of Jammu and Kashmir*. Unpublished Doctoral thesis in physical education. Jivaji University, Gwalior, 124.
8. Zuti, W.B., and Corbin, C.B. (1977). conduct a research on physical fitness norms for college. *Freshmen Research Quartly*, 499.
9. Morgan, W.P., and Goldstone, S.E. (eds.) (1987). *Exercise and mental health*. New Jersey: Hemisphere Publishing.
10. Brown, J.D., and Lawton, M. (1986). Stress and well-being in adolescence: The moderating role of physical exercise. *Journal of Human Stress*, 12, 125 - 131.
11. Ross, C. E., and Hayes, D. (1988). Exercise and psychological well being in the community. *ARE J.Epidemiol*, 127, 762 - 771.
12. Nicola, B., and Laurel, B. (2002). Optimal Physical self-concepts for children. *Primary Educator*, 8, 18.
13. Gill, J. S., and Chauhan, M. (1989). Effect of four week intensive training in physical education activities on self concepts of tribal students." *Research Bi Annual for Movement*, 8, 23 - 28.

14. Kangne, S. E. (2004). *Development and standardization of a test battery for the selection of junior handball players in Maharashtra*. Unpublished Doctoral thesis. Pune University, Pune.
15. Satya Paul Kumar, P. P. (1992). *Development of Norms to Selection of Volleyball Players of Nagarjuna University*. Unpublished Doctoral thesis. Pune University, Pune.
16. Wangwad, V. S. (1985). *Development of Norms for Selection of Volleyball Players in Maharashtra*. Unpublished Doctoral thesis. Pune University, Pune.
17. Hoffman, J. (2006). *Norms for Fitness, Performance, and Health*. United State: Human Kinetics
18. Frey, G. C., Chow, B. (2006). Relationship between BMI, physical fitness, and motor skills in youth with mild intellectual disabilities. *International Journal of Obesity*. 30, 861 - 867.
19. Huang, Y. C., Malina, R. M. (2007). BMI and health-related physical fitness in Taiwanese youth 9-18 years. *Medicine and science in sports and exercise*, 39, 701 - 708.
20. Hands, B., Larkin, D., Parker, H., Straker, L., Perry, M. (2008) The relationship among physical activity, motor competence and health-related fitness in 14-year-old

adolescents. *Medicine and science in sports and exercise*, 40, 384.

21. Joseph, P., Garry, M. D., John, J., McShane, M. D. (2002)¹. Analysis of Lipoproteins and Body Mass Index in Professional Football Players. *Jacq Communications, Inc.*
22. Luis A M., Juan F. L., Ruth, S., María, I. M., Jesús, F.(2004). Body composition in young male football (soccer) players. *Nutrition Research*, 24, 235 - 242.
23. Cerizza, C., Menchise, C., Campanini, E. (2007)¹ Overweight and obesity in a sample of young soccer players undergoing the first preparticipation physical examination. *Sport Sciences for Health*,
24. 'Palestine's Football pride', BBC News, July 2004, [Online], Available:http://news.bbc.co.uk/2/hi/middle_east/3834193.stm [2008, November 18]
25. Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation of a comprehensive of athletes' psychological skills. *Journal of Sports Sciences*, 17, 697 - 711.
26. Hardy, L., Jones, J. G., & Gould, D. (1996). *Understanding psychological preparation for sport; theory and practice of elite performers*. Wiley, Chichester.

27. Murphy, S., & Tammen, V. (1998). In search of psychological skills. In *Advances in sport and exercise psychology measurement* (edited by J.L. Duda), 195 - 209. Morgantown, WV: Fitness Information Technology.
28. Lane, A. M., & Terry, P. C. (2000). The nature of mood: Development of a conceptual model with a focus on depression. *Journal of Applied Sport Psychology*, 12, 16 - 33.
29. Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191 - 215.
30. Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist*, 37, 122 - 147.
31. Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
32. Moritz, S. E., Feltz, D. L., Fahrback, K. R., & Mack, D. E. (2000). The relation of self-efficacy measures to sport performance: A meta-analytic review. *Research Quarterly for Exercise and Sport*, 71, 280 - 294.
33. Reilly, T., Williams, A. M., Nevill, A., & Franks A. (2000). *Sport & Exercise Science Journal of Sports Sciences*, 18, 695 - 702.
34. Magni, M., Peter, K., Jens, B. (2002). Match performance of high-standard soccer players with special reference to

- development of fatigue. *Journal of Sports Sciences*, 2003, 21, 519 - 528.
35. Nache, C. M., Bar-Eli, M., Perrin C., & Laurencelle, L. (2004). Predicting dropout in male youth soccer using the theory of planned behavior. *Scandinavian Journal of Medicine & Science in Sports*, 15, 188 - 197.
36. Dvorak, J., George, J., Junge, A., & Hodler, J. (2007). Application of MRI of the wrist for age determination in international U-17 soccer competitions. *British Journal of Sports Medicine*, 41, 497 - 500.
37. McMillan, K., Helgerud, J., Macdonald, R., & Hoff, J. (2005). Physiological adaptations to soccer specific endurance training in professional youth soccer players. British Journal of Sports Medicine, 39, 273 - 277.
38. Helgured, J., Engen, L. C., Wisoff, U., and Hoff, J. (2001). Aerobic endurance training improves soccer performance. *Medicine and Science in Sports and Exercise*, 33, 1925-1931.
39. Bangsbo, J., & Lindquist F. (2007). Comparison of Various Exercise Tests with Endurance Performance during Soccer in Professional Players. *Thieme eJournals*, 13, 125 – 132.

40. Thomas, R., & David, G. (2003). Science and football: a review of applied research in the football codes. *Journal of Sports Sciences*, 21, 693 - 705.
41. Hoff, J. (2005). Training and testing physical capacities for elite soccer players *Journal of Sports Sciences*, 23, 573 - 582.
42. Wisloff, U., Castagna, C., Helgerud, J., Jones, R., & Hoff, J. (2004). Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players. *British Journal of Sports Medicine*, 38, 285 - 288.
43. O'Donoghue, P. (2005). Normative Profiles of Sports Performance. *International Journal of Performance Analysis in Sport*, 5, 104 -119.
44. Michelle, M. P., Albert, V. C., and Todd, M. L. (2005). The influence of team norms on the cohesion–self-reported performance relationship: a multi-level analysis. *Psychology of Sport and Exercise*, 6, 479 - 493.
45. Muller, E., Benko, U., Raschner, C. and Schwameder, H. (2000). Specific fitness training and testing in competitive sports. *Medicine & Science in Sports & Exercise*, 32, 216-220.
46. Menchise, C., Cerizza, C., & Campanini, E. (2007). Overweight and obesity in a sample of young soccer players

undergoing the first pre participation physical examination.

Sport Sciences for Health,

47. [http://www.webencyclo.com/dossiers/contenu/D49-0010317.asp? I Dossier=49](http://www.webencyclo.com/dossiers/contenu/D49-0010317.asp?I_Dossier=49) [2009, Jan]

-
- ¹ Wisloff, U., Helgerud, J. & Hoff, J. (1998) Strength and endurance of elite soccer players, Medicine and science in sports and exercise, vol. 30, Issue 3, Page 462-467
- ² Davids K., Lees A. & Burwitz, L.(2000) Understanding and measuring coordination and control in kicking skills in soccer: Implications for talent identification and skill acquisition. Journal of Sports Sciences, Volume 18, Issue 9, Page 703-714
- ³ Sérgio T. da F., Juliana M. O., Paula L.P.,Raquel S. B., Christiano A. C. and Letícia L. W. (2007). Characterization of professional soccer players' muscle performance. Rev Bras Med Esporte, vol.13, n.3, pp. 143-147
- ⁴ Mehrez, A & Michael, Y. Hu (1995) Predictors of the Outcome of a Soccer Game – a Normative Analysis Illustrated for the Israeli Soccer League. ZOR Mathematical Methods of Operations Research 42:361-372
- ⁵ Shinde A.F.(2005) Prepared Standardization of Norms for Health Related Physical Fitness of First year College Student, Aurangabad University, Aurangabad.
- ⁶ Beckford P.A. (1979), A normative study of the physical fitness of 14, 15 and 16 years old Navajo girls using AAPHER youth fitness test. Completed research in health, Physical education and Recreation, P 159.
- ⁷ Singh P. (1988) Undertook a normative study of the physical fitness of male teenagers of the state of Jammu and Kashmir. unpublished Doctoral thesis in physical education. Jivaji University, Gwalior P- 124.
- ⁸ Zuti W.B. and Corbin C.B. (1977) conduct a research on physical fitness norms for college. Freshmen Research Quartly, P- 499.
- ⁹ Morgan, W.P. and Goldstone, S.E. (eds.) (1987). Exercise and mental health. New Jersey: Hemisphere Publishing.
- ¹⁰ Brown J.D. and Lawton M. (1986) "Stress and well-being in adolescence: The moderating role of physical exercise." Journal of Human Stress, 12, pp.125-131.
- ¹¹ C.E. Ross and D. Hayes, "Exercise and psychological well being in the community." ARE J.Epidemiol, 1988, pp.127,762-771.
- ¹² Nicola Brake, and Laurel Bornholt, "Optimal Physical self-concepts for children." Primary Educator, 2002, 8, 2, p.18.
- ¹³ J.S. Gill, and M. Chauhan, "Effect of four week intensive training in physical education activities on self concepts of tribal

students.” Research Bi Annual for Movement, 1989, 8, 1, pp.23-28.

¹⁴ Kangne S.E. (2004) Development and standardization of a test battery for the selection of junior handball players in Maharashtra. Pune University, Pune.

¹⁵ Satya Paul Kumar P.P.(1992) Development of Norms to Selection of Volleyball Players of Nagarijuna University. Pune University, Pune.

¹⁶ Wangwad V.S.(1985) Development of Norms for Selection of Volleyball Players in Maharashtra. Pune university,Pune.

¹⁷ Hoffman J. (2006). Norms for Fitness, Performance, and Health. United State: Human Kinetics

¹⁸ Frey, G. C., Chow, B. (2006). Relationship between BMI, physical fitness, and motor skills in youth with mild intellectual disabilities. *International Journal of Obesity*. vol. 30, p.p. 861–867.

¹⁹ Huang, Y. C., Malina, R. M. (2007). BMI and health-related physical fitness in Taiwanese youth 9-18 years. *Medicine and science in sports and exercise*, vol. 39, Issue 4, pp. 701-708.

²⁰ Hands, B., Larkin, D., Parker, H., Straker, L., Perry, M. (2008) The relationship among physical activity, motor competence and health-related fitness in 14-year-old adolescents. *Medicine and science in sports and exercise*, vol. 40, Issue 2,p. 384.

²¹ Joseph, P., Garry, M. D., John, J., McShane, M. D. (2002)²¹. Analysis of Lipoproteins and Body Mass Index in Professional Football Players. *Jacq Communications, Inc*.

²² Luis A M., Juan F. L., Ruth, S., María, I. M., Jesús, F.(2004). Body composition in young male football (soccer) players. *Nutrition Research*, Volume 24, Issue 3, Pages 235-242.

²³ Cerizza, C., Menchise, C., Campanini, E. (2007)²³ Overweight and obesity in a sample of young soccer players undergoing the first preparticipation physical examination. *Sport Sciences for Health*,

²⁴ ‘Palestine’s Football pride’, BBC News, July 2004, [Online], Available:http://news.bbc.co.uk/2/hi/middle_east/3834193.stm [2008,November 18]

²⁵Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation

of a comprehensive of athletes' psychological skills. Journal of Sports Sciences, 17, 697-711.

²⁶ Hardy, L., Jones, J. G., & Gould, D. (1996). Understanding psychological preparation for sport; theory and practice of elite performers. Wiley, Chichester.

²⁷ Murphy, S., & Tammen, V. (1998). In search of psychological skills. In Advances in sport and exercise psychology measurement (edited by J.L. Duda), pp. 195-209. Morgantown, WV: Fitness Information Technology.

²⁸ Lane, A. M., & Terry, P. C. (2000). The nature of mood: Development of a conceptual model with a focus on depression. Journal of Applied Sport Psychology, 12, 16-33.

²⁹ Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

³⁰ Bandura, A. (1982). Self-efficacy mechanisms in human agency. American Psychologist, 37, 122-147.

³¹ Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman.

³² Moritz, S.E., Feltz, D.L., Fahrback, K.R., & Mack, D.E. (2000). The relation of self-efficacy measures to sport performance: A meta-analytic review. Research Quarterly for Exercise and Sport, 71, 280-294.

³³ T. Reilly; A. M. Williams; A. Nevill; A. Franks 2000; [Sport & Exercise Science Journal of Sports Sciences](#), Volume 18, Issue 9 September 2000 , pages 695 - 702

³⁴ M.Magni; K.Peter; B.Jens (2002); Match performance of high-standard soccer players with special reference to development of fatigue. Journal of Sports Sciences, 2003, 21, 519–528

³⁵ Nache, C. M., Bar-Eli, M., Perrin C. & Laurencelle, L.(2004) Predicting dropout in male youth soccer using the theory of planned behavior. [Scandinavian Journal of Medicine & Science in Sports](#), Volume 15 Issue 3, Pages 188 - 197

³⁶ Dvorak, J., George, J., Junge, A.& Hodler, J. (2007). Application of MRI of the wrist for age determination in international U-17 soccer competitions. British Journal of Sports Medicine, Volume 41 Issue 8 , Pages 497-500

³⁷ McMillan, K., Helgerud, J., Macdonald, R.& Hoff, J. (2005) Physiological adaptations to soccer specific endurance training in professional youth soccer players. British Journal of Sports Medicine. Volume 39 Issue 5, Page 273-277

³⁸ Helgured, J., Engen, L. C., Wisoff,U. and Hoff, J.(2001) Aerobic endurance training improves soccer performance. Medicine and Science in Sports and Exercise. Vol. 33, No. 11,Page 1925-1931.

³⁹ Bangsbo, J. & Lindquist F. (2007). Comparison of Various Exercise Tests with Endurance Performance during Soccer in Professional Players. Thieme eJournals, Volume 13, Page 125 – 132.

⁴⁰ Thomas, R. & David, G. (2003) Science and football: a review of applied research in the football codes Journal of Sports Sciences, Volume 21, Issue 9, September Page 693-705

⁴¹ Hoff, J.(2005) Training and testing physical capacities for elite soccer players Journal of Sports Sciences, Volume 23, Issue 6, Page 573-582

⁴² Wisloff, U. Castagna, C., Helgerud, J., Jones, R, & Hoff, J. (2004) Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players. British Journal of Sports Medicine. Volume 38, Issue 3, Page 285-288

⁴³ O'Donoghue, P.(2005) Normative Profiles of Sports Performance. International Journal of Performance Analysis in Sport, Volume 5, Issue 1, Page 104-119

⁴⁴ Michelle M. P., Albert V. C. and Todd M. L (2005) The influence of team norms on the cohesion–self-reported performance relationship: a multi-level analysis. Psychology of Sport and Exercise Volume 6, Issue 4, Pages 479-493

⁴⁵ MÜLLER, E., U. BENKO, C. RASCHNER, and H. SCHWAMEDER (2000) . Specific fitness training and testing in competitive sports. Medicine & Science in Sports & Exercise, Vol. 32, No. 1, Page 216-220

⁴⁶ <http://www.webencyclo.com/dossiers/contenu/D49-0010317.asp?IDDossier=49> [2009, Jan]