CHAPTER I

INTRODUCTION


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The body is the temple of the soul and to reach the harmony of the mind, body and spirit, the body must be physically fit (Bucher, 1968)

1.1 Soccer demands

Soccer is the most popular sport in Iran and is a much acclaimed sport worldwide. Soccer stands ahead in the list of professionally played sports and is widely accepted amongst people of all ages. ‘It is reported that in every sports event, top level performers require a particular body size and shape, while other aspects could be nearly similar (De Garay et al., 1974).

Soccer is characterized as vigorous, high intensity, intermittent, ball and contact sport. Functional activities include acceleration, deceleration, jumping, cutting, pivoting, turning, heading and kicking of the ball. It is obvious that the game of soccer puts many demands on the technical and physical skills of the individual player. Soccer is one of the most popular sports with over approximately 200 million players in 186 countries registered with the International Federation of Football Association (FIFA, 1992). Further there is estimated to be an equal number of unlicensed soccer players. A soccer player needs to meet at least minimum physical, physiological and psychological requirements to cope with the demands of competition and reduce the risk of injury. Individual player factors are often related to soccer performance (McGrath and Ozanne-Smith, 1985-1997).

Soccer requires intermittent physical activity in which sequences of actions requiring a variety of skills of varying intensities are strung together. Running is the predominant activity, yet explosive type efforts such as sprints, jumps, duels, and kicking are important factors for successful soccer performance. These efforts depend on maximal strength and anaerobic power of the neuromuscular system, more particularly of the lower limbs. Maximal strength refers to the highest force that can be performed during one maximum voluntary contraction, and is considered important for soccer performance. By increasing the available force of muscular
contraction in appropriate muscles or muscle groups, acceleration and speed in skills critical to soccer such as turning, sprinting, jumping, and changing pace may improve. The evaluation of muscle strength of the lower extremities in soccer has been performed using Isokinetic peak torque and free weights. Anaerobic power refers to the ability of the neuromuscular system to produce the greatest possible impulse in a given time period. Sprint performance, vertical jumps, and kicking performance have been used to test the anaerobic power of soccer players. Indeed, in many studies some strength and anaerobic power characteristics differentiated elite from non-elite soccer players (Cometti et al., 2001).

Football is probably the world’s most popular sport, played in practically every nation at varying levels of competence. Football may be played competitively or for fun, as a career, a means of keeping fit or simply a recreational pursuit. Most sports, including football, require certain physical characteristics and body composition, and whilst there is an increased interest in football judging by the popularity of events such as the World Cup, few standards for boy teams world-wide exist (Reeves et al., 1999).

Soccer is a game that places emphasis on a player’s physical conditioning as well as a player’s soccer skills. None of the major sports demand such a balance between aerobic fitness and sport-specific skills. But how much does the sport of soccer demand of a person’s physical characteristics when the game is played at the different levels of competition in the course of a 90-minute match?

The overall performance and fitness of soccer players largely depends on the important factors like the body size, proportions, the physical and body compositions. Historically, the height and weight, both indicators of the overall size of the body, have been used extensively with age and sex, to identify optimal combinations of these variables in groups of children, teenagers and young adults, in various types of physical activities. Body size, particularly weight, the standard references to express the physiological parameters (e.g. the vo2 max. M l. Kg. as -1 min. -1), while the thickness of skin folds is often used to identify overweight and obesity, and to establish the relationship between overweight and physical fitness related to health and life expectancy. Therefore, anthropometry is crucial as it relates to physical activity and sports sciences (Malina, 2006).
Football is a sport game played at junior level by amateurs, semiprofessionals and professionals. The play is physically demanding requiring players to participate in phases of intense activity followed by short phases of low intense activity and the football players must develop some fitness components such as: muscular power, speed, agility and aerobic power (Bangsbo et al, 2006).

1.2 Role of anthropometry in sport

A successful sport engagement demands continuous training from an early age. Apart from training sessions, in order to succeed in contemporary sport it is essential for an athlete to possess certain genetically conditioned abilities and features. To meet the demands of state-of-the-art football continual guided selections are necessary from early on all the way to the national team selection. Body composition, anthropometric dimensions, and morphological characteristics play a vital role in determining the success of an athlete. Contemporary football presupposes the existence of a certain body structure, of strong enduring football players marked by great football intelligence, controlled aggressiveness, and highly developed functional and motor abilities, with a sense for improvisation and a collective game. The analyses up to date that have researched anthropometric dimensions point to the fact that contemporary football is dominated by football players of above-average height compared to the selection pool population, and their build tends to be athletic. The relation between height and body mass is equally important due to the fact that modern football implies duel play, jump head play, fast activities (alternating offense and defense), all of which are linked to efficient realization and the obligatory playing time during the entire match. In contemporary football, there are fewer football players of lower body height. In case they belong to this category, they must have other qualities to ensure achieving the same results as taller players (Joksimovic et al, 2009).

Research findings of a study showed that the athletes’ somatotype and anthropometric characteristics are related to the type of each sport. In addition, there is a relationship between high athletic performance and physical characteristics, like height, low percentage of body fat and high muscle mass (Hatzimanouil, 2005).
1.3 Role of motor fitness in sport

Soccer belongs to an aerobic-anaerobic (stop-go) type of sport with alternate phases of high load as sprints, fast zigzag running, jumps, sudden stops, etc. Practically in all activities a player carries his mass, moves it against the force of gravity so that each excess of body fat represents an overload which additionally burdens the energy mechanisms and makes the execution of a whole series of activities, especially the jumps and sprints, more difficult (Matkovic et al., 2006).

Motor ability, sprinting, jumping, flexibility and throwing velocity represent physical activities that are considered as important aspects of the game and contribute to the high performance of the team. Successful performance requires explosive power of the legs and arms, sprint velocity and kinesthetic feeling in ball control (Sibila, 1997).

In order to a team to be successful, it is essential that both its center backs and the goalkeepers have a privileged height, as they perform a higher amount of vertical jumping, and thus, they are willing to be successful in their movements. Opposite to this, running backs, midfielders and strikers are lower and rather run with the ball, and they are quicker, and this fact grants to them an additional advantage against the center backs (Al-Hazzaa et al., 2001 and Bangsbo, 1994).

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The assessment of fitness and physical profiles of professional soccer players has become common over 30 years. The information provided through testing allows physical performance to be monitored and evaluated while providing a means to identify weaknesses and thus create efficient and especially adapted training programs. Tests must reflect the fitness requirements for soccer playing - flexibility, speed, speed endurance and aerobic endurance (Chan, 2006).

1.4 Role of technical skills in sport

Comprehensive physiological, psychological, and tactical qualities are needed to become a professional soccer player. Another prerequisite for young soccer players to progress is that they possess a certain level of technical skills. Currently, there is no generally accepted standard
test to measure technical qualities, thus it is unclear what level of technical skills is required to be among the best adolescent players. The principal technical skills are shooting, passing, ball control, and dribbling (Reilly & Holmes, 1983).

Dribbling speed is considered critical to the outcome of the game, with elite soccer players performing 150–250 brief intense actions during a game. Therefore, the ability to sprint and dribble at high speed is essential for performance in soccer. Previous research has indicated that the better players distinguish themselves by their running speed while dribbling the ball. Dribbling in soccer can be categorized into dribble actions while accelerating and dribble actions with quick changes of direction. Acceleration is of great importance, as soccer players only cover short distances (mean distance 10–20 m) at maximal effort. Furthermore, many actions in soccer involve repeated short sprinting or dribbling with changes of direction. This ability to change direction rapidly is called “agility”. Acceleration and agility while sprinting have been identified as independent qualities. It is not yet clear whether dribbling while accelerating and dribbling while performing agility task measure different components of the technical skill of dribbling, and what the exact relationship is between sprinting and dribbling over the same course (Huijgen et al., 2010).

Techniques, or sport-specific technical skills, are a central component in the development of young athletes in many sports, including soccer. A variety of tests has been developed to evaluate ball control with the body (trapping), head (heading) and feet (dribbling), passing (short and long), shooting accuracy, throwing and kicking for distance, agility and volleying, among others. The focus is often on the validity of the tests, changes in performance with age among youth players, comparisons of skills in youth and professional players classified by level of competition or expertise, and occasionally relationships between skill tests and outcomes of match-play. Several studies have considered the kinematics of specific skills and the strength and flexibility of players of different skill levels in soccer, and the physical fitness and soccer skills of youth players and non-players. The effect of specific training programs on sport’s specific skills, including jumping and kicking, has also received consideration. Studies of youth soccer players have not systematically considered the potential influence of variation in growth and biological maturity status upon sport-specific football skills. Youth soccer players classified as elite and non-elite, or as being high and low in football ability, for example, differ in body size and maturity, and in strength, flexibility and soccer-specific skills. Unfortunately, individual
differences in size and maturity are not considered in the comparisons of such select samples (Malina et al, 2005).

Top-class soccer players have to adapt to the physical demands of the game, which are multi-factorial. Players may not need to have an extraordinary capacity within any of the areas of physical performance but must possess a reasonably high level within all areas. This explains why there are marked individual differences in anthropometric and physiological characteristics among top players. Various measurements have been used to evaluate specific aspects of the physical performance of children, adolescent and young soccer players. In the present study, the researcher was interested to assess 1) the contribution of selected anthropometric and motor fitness variables to soccer performance; 2) comparison of the players playing in different position and two stages of age groups of adolescence; and 3) the relationship between variables, in order to detect and identify talent of susceptible persons for the best soccer performance.

1.5 Statement of the problem:

The purpose of the present study is to find out the contribution of selected anthropometric and motor fitness variables to soccer performance among adolescent boys.

1.6 Objectives:

The main objectives of the study were:

1. To find out the relationship between selected anthropometric variables and soccer performance among elite adolescent boys
2. To find out the relationship between selected motor fitness variables to soccer performance among elite adolescent boys.
3. To find out the difference between elite players playing in different positions in selected anthropometric and motor fitness variables in relation to performance.
4. To find out the difference between secondary and high school elite boy soccer players in selected anthropometric and motor fitness variables in relation to soccer performance.
5. To find out the contribution of selected anthropometric and motor fitness variables to soccer performance among adolescent elite boy soccer players

6. To find out the contribution of selected anthropometric and motor fitness variables to soccer performance among the elite boy players playing in different position.

7. To find out the contribution of selected anthropometric and motor fitness variables to soccer performance among secondary and high school elite boy players.

1.7 Hypotheses:

Following directional hypotheses were formulated for the investigation.

1. The selected anthropometric variables will be positively and significantly related to soccer performance.

2. The selected motor fitness variables will be positively and significantly related to soccer performance.

3. Elite soccer players playing in different positions differ significantly in their anthropometric and motor fitness variables.

4. Secondary and high school elite boy players playing soccer differ significantly in their anthropometric and motor fitness variables.

5. Only few anthropometric and motor fitness variables contribute to soccer performance.

6. There will be differential contributions for soccer performance by elite players playing in different positions.

7. There will be differential contributions for soccer performance by elite players belonging to different age groups.

1.8 Limitations:

1. The quality of nutrition, health states, sleep and rest of subjects were controlled by the coaches.

2. The cooperation and help of administrators, coaches and subjects were not under the control of the researcher.
1.9 Delimitations:

1. The study was delimited to adolescent boy soccer players in Iran.
2. The study was delimited to the members of eight upper premier league teams of Iran in the academic year 2011-12.
3. The study was delimited to elite soccer boy students of secondary school aged 13-15 years and high school aged 16-17 years.
4. The study was delimited to anthropometric measurements 12 components of body size and 7 components of body composition.
5. The study was delimited to six motor fitness variables.
6. The study was delimited to six soccer skill tests by administering soccer skill available in the methodology.
7. The study was delimited to 240 adolescent elite boys representing the secondary and high schools in the soccer championship conducted in the academic year 2011-12.

1.10 Operational Definitions:

1.10.1 Anthropometric measurements: Anthropometric measurements contain the use of corporal reference marks, carefully defined, the positioning of specific subjects for these measurements, and use of appropriate tools. The measurements taken on an individual are almost unlimited in quantity. Generally, the measurements are divided into: body mass (weight), lengths and heights, widths and diameters, depths, circumferences or perimeters, bends or arcs and measurements of the soft tissues or skin folds (Malina, 2006).

1.10.2 Performance: Carrying out or completing an action (Johnson & Nelson, 1986). In this study it was administered through the soccer skill tests, 50 points and coaches’ viewpoints about performance ability of the players, 50 points, as total performance points.

1.10.3 Soccer skill tests: The study refers to the six specific skills of soccer, ball control with the body, ball control with the head, dribbling with a pass, dribbling speed, passing accuracy, and shooting accuracy.
1.10.4 **Coaches’ viewpoints about performance ability of the players:** The study refers to the viewpoints of the 3 teams’ coaches via a private questionnaire that is explained in the methodology.

1.10.5 **Motor fitness:** A readiness or preparedness to performance with special regards for big muscle activity without under fatigue. It concerns the capacity to move the body efficiently with force over a reasonable length of time (Harold M. and barrow Rosemary Mc gee, 1979). In this study, selected motor fitness variables administered 1) speed by the 50-yard dash, 2) agility by the AAHPERD shuttle-run, 3) low back and hamstring muscles flexibility by the AAHPERD sit-and-reach test, 4) legs’ explosive power by the vertical jump, 5) general muscular endurance by the Burpee test and 6) cardiorespiratory endurance by the 1-mile run/walk test.

1.10.6 **Cardio respiratory or aerobic endurance:** The ability to do moderately strenuous activity over a period of time. It reflects how well your heart and lungs work together to supply oxygen to your body during exertion and exercise. It is also called aerobic fitness.

1.10.7 **Muscular endurance:** The ability of muscle to repeat movements against sub maximal resistance or pressure or to maintain a certain degree of tension over time.

1.10.8 **Flexibility:** The ability to move a joint through its full range of motion; the elasticity of the muscle. This shows how limber or supple you are.

1.10.9 **Body composition:** The proportion of fat in your body (fat percent) compared to your bone and muscle (lean body mass percent). It does not refer to your weight in pounds or your figure.

1.10.10 **Agility:** The ability to change direction quickly and easily with the body and its parts.

1.10.11 **Speed:** Pure speed- the ability to cover the distance between two points in the shortest amount of time.

1.10.12 **Power:** The application of strength with speed. Explosive action of performance:

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\text{Strength + Speed} = \text{Power}.
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1.10.13 **Secondary school elite boy soccer players:** This study used high level boy soccer players aged 13-15 years who represent the eight upper premier league teams in Iran and studying in secondary schools.
1.10.14 **High school elite boy soccer players:** This study used high level boy soccer players aged 16-17 years who represent the eight upper premier league teams in Iran and studying in high schools

1.11 **Significance of the study:**

1. The study may provide directions for coaches and administrators to find out the most important anthropometric and motor fitness variables contributing to the best soccer performance.

2. The findings may be used in talent identification and talent development of soccer players of different age groups playing in different positions.

3. The present study may help in maximizing the efficiency of training programs in soccer, improvised management of time, considerable savings on the financial budgeting and much improved investment.