CHAPTER I
INTRODUCTION

In the current years of physical education and sports have specifically under the impact of scientific advancement and new discoveries in sport science. The field of physical education has been keeping up with the development and growth of every brand of Biology, Medicine, and many others sciences and this association has led to the emergence of new affiliation in physical education and sport science. Thus, the trend of evaluation and variety in physical education has brought about new challenges for this fields. So far interestingly enough, thanks to the expansion and association of physical education with various aspects to social and human capabilities, it has been defended its practical and capacities. One of the new fields of sports science is the science of training or theory of training, which based on the medical achievement and physiology of training. It also draws on the other sciences, such as assessment and measurement, psychology, biomechanics, etc.

Among the influential factors in the science of training, two important issues are the criteria of physical and motor fitness and exercise program. The former is used by all the experts not only to determine the suitable individuals and sport talent but also it is a criterion to evaluate the effectiveness of exercise program and syllabi.

During history, physical fitness has been always interested in by different people with different perspectives. Since the creation of the man, physical fitness is being along the man as a surviving means and to meet the necessary daily needs.

Fitness has been recognized from time immoral as the greatest wealth. It has rightly been said, though fitness many not be everything, everything without fitness is nothing. The body is the temple of soul and to reach harmony of body mind and spirit, the body must be physically fit. Physical fitness is our priceless asset, whether it is considered in terms of beauty, strength, enjoyment of life and ability to do a particular job. The primary aim of physical fitness is to insure that life will survive.
For the animals, based on animal plan, and for the human based on human plan (Austin Hove)\textsuperscript{1} According to some of the physical education experts, physical fitness is just related to conditioning and performing the sport skills, meanwhile others believe that physical fitness is the most important aim of physical education program and defined it on the base of social, emotional and mental readiness.

1.1 History of Physical Fitness

Since early in the development of the home sapiens, people have realized the benefits of being physically fit varying cultures overtime have given greater or lesser emphasis to physical fitness. As the civilization developed, the body appraised by sculptor, soldier and teacher alike. The Greeks provided a rich heritage of mind body with and glorified the aesthetically developed all sound athlete. Varying dramatically from this ideal were the Spartan soldiers, the specialized professional athletes of the later Greek era. The Roman in the early part of the empire illustrated the utilitarian foal of fit people. During the next thousands years only the knight developed their bodies but they did so primarily for military conquest rather than for any inherent values. The renaissance led by the philosophers and educators reemphasized. In the second period of Athens, Golden era, physical training which was the main part of pedagogy principals, has changed to professional sports and gladiatorism.\textsuperscript{2} The Persian Empire, according to the historians, the sports and physical training were the integral part of Persian’s cultural society. According to Avesta, the holy book of Zoroastrians, one


should ask the god to give him/her a strong body. The sound body, sound mind is a famous proverb of Zoroastrians.

Naturalism and Nationalism directly influenced the development of gymnastics system in Germany, Sweden, England and Russia. During the year 1777-1840, the reformers in United States concerned about people’s health and fitness, so this led to physical education in schools. It was during the war years of the early 1940s that the terms of physical fitness became generally used. Fitness all over the world really began in the 1970s with joggers leading the boom.3

1.2 What is Fitness?

Fitness is the ability of the individual to live a full and balance life. It involves physical, mental, emotional, social and spiritual factors and capacity for their wholesome expression. All are closely interwoven into the fabric of the whole person. The totally fit person has a healthy and happy outlook on life. He satisfies such basic needs as physical, love, security and self-respect. There are some definitions which have been suggested by some famous people are quoted below:

According to General Lewies, B. Hershey, the head of selective service 4 “fitness in a man or women is that quality, inherent and acquired, which renders than men and women qualified to serve to the limit of his or her physical strength to renders the maximum of his or her mental capabilities and capacities and on a high moral plan and which recognizes fully his or her obligations to the family, the neighbors, the community, the state, and the nation.

Marion B.Folsom, Secretary of the department of health, education and welfare has stated5: there is a tired dimension to fitness, and that is the: Capacity to function in very way at one’s best- physically, mentally and spiritually. I wonder if we are moving towards a concept of well-being that involves not only physical

3 Betty Spears and Richard A. Swanson,(2002). History of sport and physical education in the united state. USA: WM.C. Brown Publisher .p.86 -88
5 Ibid. ,P 210
prowess but also the whole of means capacity for expression. A fit person, as can be seen from these definitions, is the one who:

- physically has strong organic base, exhibits vigor and is active, is skilled in some physical activities and enjoys a sense of well-being.
- socially recognizes the principle once stated by justice stone that “no man can live unto himself alone” and therefore, understands and respect the rights of others like people. Practices services above self and makes satisfactory group adjustments.
- mentally has a healthy outlook on life, thinks independently and constructively, has good judgment, is resourceful, and wants to be fit.
- emotionally has stability and self-control, faces reality in an honest manner, and has high ethical standards.

It appears that children are generally born as healthy and fit individuals. As they grow, their levels of fitness change. Whether a child remains fit depends largely on environment, attitude, knowledge and lifestyle.

Fitness is vital especially in childhood to help children develop a lifelong habit of exercise (Camilleri et al. 2002) and the results of what she/he have achieved in childhood (Ballucci, 2000). Bellucci, emphasized on the importance of fitness during childhood when declaring that problems regarding physical fitness should be tackled at an early age, since at the age of eighteen and over, trying to remedy such problems would be too late. It is very important that children become familiar with the principles of regular physical activities. In fact, the American heart association stated that: “persons of all ages should include physical activity in a comprehensive program of health promotion and disease prevention and should increase their habitual physical activity to a level appropriate to their capacities heeds and interest

6 (2002).

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Jones, Shermbag and Obyer, have described fitness which implies the ability to function at an optimum level of efficiency in daily living. It means total fitness encompassing the whole philosophy of health i.e. social, emotional and physical condition of the individual involving intellectual, emotional and social as well as physical conditioning.

1.3 What is Concept of physical Fitness?

“Fitness is a Journey, not a destination; it must be continued to the rest of the life” Dr, Kenneth Cooper

No definition of physical fitness appears to be widely accepted, nor there shall agreement about what specific components make up a fitness evaluation. Many of the authors and scientists agree that physical fitness is multidimensional construct (March 1993,Kemper ,Van Mechken 1996) According to Hinson ,the definition of fitness has changed dramatically over the years (1995).Over 60 years ago, Steinhaus (1936) evidently viewing physical fitness from the perspective of the physiologist, defined it as distance from death, a description somewhat like that of many in the medical profession, who tend to regard physical fitness as absence of disease.

Will goose (1961) have defined it as a capacity for sustained physical activity. A more appropriate and universal definition of physical fitness, at least from health perspective, maybe the one found in Mosby’s medical and nursing dictionary (1980) which defines physical fitness as, “The ability to carry out daily tasks with alertness and vigor without undue fatigue, and with enough reserve to meet emergency or to enjoy leisure time pursuit”. Physical fitness, as one aspect of total fitness, involves three important concepts. It is related to the tasks the

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person must perform, his/her potential for physical efforts and relationship of his/her physical fitness to his/her totals self. The same degree of physical fitness is not necessary for everyone. It should be sufficient to meet the requirements of the job, plus a little extra as reserve for emergencies. The question of “fitness for what must always be asked”.

Furthermore, in discussing the physical fitness for what must be always asked. Physical fitness cannot be considered by itself, but instead, as it is affected by mental, emotional and spiritual factors as well. Human beings function as a whole and not in segmented parts.

Some definitions of physical fitness that come from leaders in the field are as follows:

Moorow, Jaekson, Diseh and Mood stated (1995). 9: Physical fitness is a multifaceted objective, with different meanings to different people. They stated that whether the understanding of physical fitness, it is related to two primary factors:

- The general public should possess sufficient levels of physical fitness for improved health and to deal with physical challenges that may confront with.
- Improvement and maintenance of physical activity and fitness as an important step in developing a healthy life style. The definition of fitness can be based on who and what is to be measured. The same authors define fitness as the attainment or maintenance of physical capacities that are related to good or improved health and are necessary for performing daily activities and confronting expected or unexpected physical challenges.

Adams, (1991)10 argued that physical fitness is the fundamental dimension of health. Hinson defined fitness as a continuum (Fig 1)11. He argued that one should emphasize, living more fitness–oriented life style (1995) with everyone always trying to move in the positive life style direction.

Table 1.1 The fitness continuum (from Hinson 1995)

<table>
<thead>
<tr>
<th>Decreased level of fitness</th>
<th>Negative Lifestyle Direction</th>
<th>Positive Lifestyle Direction</th>
<th>Increasing level of fitness</th>
</tr>
</thead>
</table>

Schneider and karpovich define physical fitness as; fitness to perform some specific task requiring muscular effort. To be practical, fitness should consider quality of efforts as well as intensity of efforts.12

Mc Cloy and Young; define physical fitness as the type of fitness produced primarily by physical training. Persons who function physically at high level of efficiency are said to be in good condition, excellent training or physically fit.13

Cureton 14, state that in addition to physiological and mental normally, physical fitness means ability to handle the body well and capacity to work hard over a long period of time.

Clark defines physical fitness as a positive quality extending on a scale from death to abundant life. An individual is considered physically fit when his capacity for performance and endurance in physical activities is great, when it is equal to his own potentiality.15

Gallagher and Brouha, discuses physical fitness in terms of: static or medical fitness-soundness of body organs, dynamic or functional fitness-efficiency of body in strenuous work, and motor skills fitness-coordination and strength in performance of activities.16

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The committee for wartime physical fitness for high schools of the United States stated; a person who is physically fit for military duty or naval service must be capable maintaining sustained efforts with a maximum of speed and skill.  

United state Army defined physical fitness as based on a foundation of anatomical and physiological soundness, supplemented by strength, endurance, agility and coordination.

According to the American Association for health, physical education, dance and recreation,” Physical fitness represents the capacity to live most vigorously and effectively with one’s own resources”.  

According to Johnson, physical fitness is a matter of fundamental importance to individual well being and to the progress of the security of our nation.

Physical fitness is the utilization of exercise calories by a cardio-vascular and muscular process bringing the body to optimum efficiency. It comprises the following factors utilization of excessive calories, purification of blood and circulation of blood by a cardio-vascular and muscular process, bringing the body to optimum efficiency.

According to J.F. Kennedy, physical fitness is the basic of all other forms of excellence.

Physical fitness implies soundness of body organs such as the heart and lungs, human mechanism that performs efficiently under exercise or work condition and a reasonable, measure of skill in the performance of selected physical activities.

17 War Department: Field manual, FM 21-20, physical training, Washington D.C .U.S printing Office  
According to Pate (1988) physical fitness means, the ability to perform daily activities with the energy and show characteristics and capacities which has little relation with the danger of the early development of hyperkinetic disease.24

Physical fitness is a condition of your body which determines how effectively you can perform your daily work and play and how will you can meet unexpected demands on your strength, your physical skills and your endurance.25

Pate (1983) has stated that; physical fitness is the capacity of the heart, blood vessels, lungs and muscles to function at optimum efficiency.26

According to Safrit (1995) physical fitness is the ability to handle the tasks performed in everyday life with enough energy reserve to enjoy leisure pursuits and deal with emergencies.27

Ratchliffe and Ratchiliffe stated that fitness is a state of well-being that allows people to perform daily activities with vigor, reduce their risks of health problems related to lack of exercise and established abuse of fitness for participation in a variety of physical activity.28

Physical fitness is a positive and dynamic quality on a continued basis from abundant life to death. We also recognize that fitness is not static condition but a dynamic one that is constantly and is influenced by many other factors.

According to the president’s Council on Physical fitness and sport29 definition of physical fitness is: physical fitness is the ability to carry out daily tasks with vigor and alertness without undue fatigue and ample energy to enjoy leisure time pursuit and meet unforeseen emergencies.

The (ACSM)\textsuperscript{30} provides this definition of physical fitness: “physical fitness is the ability to perform moderate to vigorous levels of physical activity without undue fatigue and the capacity of maintaining such ability throughout life”.

The U.S.CDG provides this definition of physical fitness: physical fitness is set of attributes that people have or achieve that relates to the ability to perform physical activity.\textsuperscript{31}

The Government of Canada provides this definition of physical fitness: A set of attributes that are either health related or performance (or skill) related Health related fitness comprise those components of fitness that exhibit a relationship with health statues. performance/skill related fitness involves those components of fitness that enable optimal work or sport performance” Physical fitness is the ability to endure, to bear up .to withstand stress, to carry on in circumstances when an unfit person could not continue, and is a major basis for good health and well –being According to Dr. Getchell:\textsuperscript{33} “physical fitness is the capacity of heart, blood vessels, lung and muscles to perform at optimal efficiency.” The reasons why thousands of people especially the young and growing children have got themselves interested to keep their physique better is physical fitness that makes them feel better, mentally sharper ,physically stronger and able to adjust demands they face every day with firm confidence.

1.4 Components of Physical Fitness

The attempt to define and breakdown the term physical fitness has led to the identification of certain specific components which collectively make up physical fitness. For many years, there have been many debates among sport scientists that

\textsuperscript{30} American College of sport medicine. Retrieved from http:// www.acsm.org
how many factors can make up the components of physical fitness. For example, Larson and Yocon, list ten components of physical fitness, namely resistance to disease, Muscular strength, muscular endurance, cardio-vascular endurance, power, flexibility, speed, agility, coordination, balance and accuracy.

Mc cloy and Young list components, such as, speed of muscular contraction, dynamic energy ability to change direction, agility, dead weight and flexibility. Cureton appraises physical fitness in terms of physique and physiological soundness and adds components which call, motor fitness. This motor fitness includes endurance, power, strength, agility-flexibility, and balance.

Morehouse and Mitter, include a physiological component which to them implies possession of necessary emotional stability drive, intelligence and educability. Although, there is no complete agreement among the leaders in the field of physical education, and sports training experts, but in recent years, most of the authorities have agreed that there are two distinct categories in physical fitness, skill related and health related fitness. Health related of fitness can be define as the attainment or maintenance of physical capacities that are related to good or improves health and are necessary for performing daily activities and confronting expected or unexpected physical challenges.

According to Loribiery and Lindie's, the components of health related fitness are: cardio-respiratory endurance, muscular endurance, muscular strength, body composition and flexibility. This definition is also supported by American collage of sport medicine (2000). Skill related fitness are those qualities that provide the individual with the ability to participate in sports activities. The components of skill related fitness, according to aforementioned scientists are: agility, balance, coordination, speed, power and reaction time. Fitness parameters, to which a lot

importance is being given these days, are the “six S” (Vaughn 1985) strength, speed, stamina, skill, sport, sport medicine.

AAPHERD (1999) declared that physical fitness can be divided into health and skill related components. The first focuses on factors that promote optimum health and prevent the onset of disease and problems associated with inactivity. The second on focuses on factors that promotes athlete’s skill ability

Adams, (1991) identified three components of physical fitness namely physique, organic efficiency and motor fitness. The first essentially represent the relationship of height to weight. The second refers to the quality of function in fundamental organ system that facilitates physical fitness, including particularly the muscular, nervous, cardio-vascular respiratory and endocrine systems; each is dependent upon hereditary predisposition and one’s physical activity level. The third is dependent upon certain aspects of other physical fitness components: body composition, cardiorespiratory endurance, and seven other elements well related to athletics performance potential namely, agility, power, muscular strength, muscular endurance, flexibility, speed and balance.

Heyward (1997) identified five components which make up physical fitness. These are described as: cardio respiratory endurance, musculoskeletal fitness, body weight and body composition, flexibility, neuromuscular relaxation.

Cumine (1996) gave her version of physical fitness and mentions four basic components namely strength, (absolute, relative, static, dynamic) speed and power, stamina and flexibility. Each components of fitness cannot be take on its own but must be seen as an integral part combined with all other components to achieve complete fitness. (Fig 1.1)

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36 Vaughn, T. (1985) *fitness within sport*. In Reilly (Ed) *Sport Fitness and Injuries*. Norwich; Fletcher and Son. P.140
38 Pate. R.R. (1989). *A New Definition of youth fitness*. In physician and sports medicine.11 (40)
Figure 1.1 Components of Motor fitness and Health -Related physical fitness (Adopted from Pate 1983)

Buchard, Shepard, and Stephens (1994) presented a comprehensive model for physical fitness (table 1.1). We can see the difference between health–related physical fitness and skill–related physical fitness.³⁹

1.5 **Aim, Objective and benefits of Physical Fitness**

The aim of the physical fitness is to mould an individual healthy, mentally alert socially activated and morally stable binder of society. The objectives of physical fitness are as follows:

- To improve health comprehensive and harmonious development of the forms and functions of the human body.
- To form the motor skills necessary for everyday life.
- To provide the necessary knowledge for a broad base fitness facilities in everyday life and instilling the habit of systematic fitness session.
- To enhance the outlook on world affairs and the spirit of internationalism.
- To develop will power, moral support and patriotic education.
- To raise the level of sporting achievement.
- To develop an understanding and appreciation of movement in children and youth so that their lives become more meaningful purposive and productive.
Physical fitness has many positive benefits for a person's body. Exercise provides health benefits, increase strength and energy, enhance a person's appearance which helps with self-esteem and also relieves stress. Physical activity has been recommended for health and well-being since the time of Hippocrates (460-379 BC). The Greek physician, Hippocrates, the father of medicine, advised that “eating alone will not keep a man well, he must also exercise.” Only in the last two decades has consistent epidemiological evidence identified that physical activity is major modifiable risk factor in the reduction of mortality and morbidity of many chronic disease (USDHHS, 1996 Armstrong, Bauman & Davies 2000). Since the 1970’s, a number of studies regarding the benefits of physical activity and fitness, the health benefits of regard activity have been affirmed and summarized in the reports from governmental and non-governmental organization, US surgeon general (1990) US national institutes of health, US center for disease control and prevention (Pate et al 1995) American college of sport medicine, American heart Association, (Blair & McColy 1993) has concluded that regular physical activity and fitness training is associated with important health benefits. There are many other benefits of fitness which can be categorized in physical and mental aspects:

- **Physical benefits:**
  - Strong heart muscle
  - Reduce blood fat, including lower density lipids (LDL)
  - Increase protective high density lipids (HDL)
  - Possible reduction in blood pressure
  - Decrease chance of adult onset diabetes
  - Reduce risk of cancer.
  - Boosts the immune system
  - Potentially prevents most forms of bone lose which accompany aging.

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● Helps keep joint flexible.
● Helps build and preserve muscle strength
● Helps diabetes cut down on the amount of insulin they must use.

**Mental benefits:**

● Improves sleeping habits
● Decreases some stress symptoms
● Ability to enjoy leisure
● Improves quality of life
● Improves self-concept and appearance
● Reducing anxiety

### 1.6 Physical Fitness Testing

The history of physical fitness testing goes back many years. It may have started as part of the physical education profession. Fitness assessment may be varied from several different perspectives, including determination of energy system utilization (maybe particularly important for sport participation), evaluation of fitness specifically for health enhancement purpose or use of traditional components tests for determination of sport fitness and profiling. Evaluation of the perceptual motor domain and vision requirement for improved sport performance could also be included in fitness assessment. Study of historical development of fitness testing is interesting and applicable to understanding of current practices.

### 1.1.6 Anthropometric Measurement

An early pioneer of anthropometric assessment was Hitchcock of Amherst College, how measured such attributes as age, height, weight, chest girth, arm girth, forearm girth and lung capacity as described in the text that he coauthored with Sealy in 1893\(^{43}\). He collected data approximately between the years of 1861 and 1880. However Seaver had published anthropometry in physical education in

1890, and this is perhaps the first modern author in this area. Description of the body type can be traced back to Hippocrates, how recognizes two basic body types and later to Rostan, how in the late 19th century proposed a classification system of three body types. Sheldon, in association with Stevens and Tucker (1940) made the first serious attempt to classify body types. As having proportion that were a mixture of the three general classifications.

1.2.6 Assessment of Muscular Strength, Endurance, and Power

In about 1880, Sargent probably initiated the move to include strength tests as major Components of fitness evaluation. In 1896, Kellogg, described a universal dynamometer, that made possible muscle strength testing that was more accurate. Sargent, in 1921, described the vertical jump test – or Sargent test, one of the first tests of muscular power.

Roger (1927) developed the strength index, considering a general test of athletic ability, and physical fitness index, divided by comparing the strength index with norms based on gender, weight, and age. The test used seven measurements, consisting of left and right hand grip strength, back strength, leg strength, strength of the arms and shoulder griddle as overhead grip, and force vital capacity associated with pull-up and dip back leg dynamometer. Mc cloy (1939) later eliminated the lung capacity test, arguing that it was not a test of muscle strength? Isometric tests evaluated by the cable tensiometer using by Clark. (1966)

1.3.6 Evaluation Of cardiovascular Fitness

Many well–known tests of cardiovascular fitness date back to the early 10th century. One of the first compared heart rate and systolic pressure response between the horizontal and standing position (Crampton 1913).The Baerach cardiovascular test, described in 1919, was another test that used blood pressure and heart rate to evaluate cardiovascular function. One of the earlier tests used to

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investigate the response of heart rate to exercise and recovery was the Foster cardiovascular test published in 1914.

Schneider (1920) used a combination of pulse rate and blood pressure obtained in the horizontal and standing position and pulse rate taken immediately following 15s of bench-stepping exercise and during recovery to evaluate aviator during world war I. Tuttle, described his well-known pulse ration test, using a bench 13.5 inch, in 1931. McCandy and Larson (1939) described a test of organic efficiency, and provide comprehensive normative tables for males, aged 18s to 80 years. More recent tests have included the renowned. Harvard step test developed by Brouha (1943) and other step tests that is still in use.

1.4.6 Energy Systems Evaluation

One approach to fitness evaluation is to base all tests on the energy systems used during physical activity. Fox, Robinson, and Wiegmen (1969) classified activity by the prime source of energy being used and proposed four time periods. Shephard (1978) described another classification system using a similar approach but with five phase. Skinner and Morgan (1984) have proposed another four–period classification system based on more recent research, particularly in the areas of power output and lactate tolerance.

1.5.6 Fitness Evaluation For Athletic

Methods used to evaluate athletic fitness depend on the requirements of the individual sport or event. Following is a brief outlined from 14 studies covering the period from 1976 to 2004, a total of 28 years. Athletes from the following team sport were studied Basketball(Parr, Hoover, Wilmore, Bachmen & Karlan,1978) Football, ( Wilmore et al 1976) Soccer( raven, Gettman, Pollock & Cooper, 1976) Rugby union, (Maud & Schultz 1984) Rugby league(Gabbett,2002) Australian

45 Peter J.Maud, Carl Foster. (2006). *Physiological Assessment of Human Fitness*. USA, Human kinetics,p.3
46 Ibid.,p.3
football (Pankin, 1982) Muscular strength, muscular endurance, cardio-vascular endurance, power, flexibility, speed, agility, coordination, balance and accuracy.

Field hockey (Rate & Pyke 1978) Team handball (Rannau, Prioux, Zouhal, Gratas, Delamarche, & delemarche, (2001) and lacrosse (Withers 1978) Individual and dual sports included are racquetball (Salmoni, Cuay & Sidney 1988) Tennis (Clarson & Cera 1990) middle weight boxing (Guidetti, Musulin, & baladavi 2002).

Many investigators have evaluated cardiovascular fitness by direct determination of maximum oxygen uptake. In studies of rugby (Maud & Schultz, 1984) football (Wilmore et al 1976) Soccer (Raven et al. 1976) Anaerobic capacities have been evaluated by a 440 YD (National Alpine staff 1990) run for downhill ski by the Wingate test for Rugby (Maud & Schultz 1984) handball (Rannou et al. 2001) and Tennis (Carlson & Cera 1984). Grip strength has traditionally been used as a general measure of muscular strength as in the studies of rugby (Maud & Schultz 1984) Soccer (Ravenetal, 1976) Boxing (Guidetti et al. 2002). Skin fold measurement was the most prevalent method for estimating body Composition 9 Carlson & Cera 1984) Maud, 1984, Porkin, 1992, Wilmore et al. 1976, parr et al. 1978. Some studies also used under water weighing technique. One study (Carlson & Cera, 1984) also described skeletal widths and circumference and another described somatotype (Wilmore et al 1976).

There are two different types of tests, the so called field tests and those that require Special equipment or are conducted in the laboratory setting. The field tests are defined As those tests that may be completed outside the laboratory environment and do not Require specialized equipment for data collection or recording. Table (1.3) gives examples of both types of commonly used test. Table 1.3 Classifications of Tests Types: Field Tests and Laboratory Tests.

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### Table 1.3
Classifications of Tests Types: Field Tests and Laboratory Tests.

<table>
<thead>
<tr>
<th>Fitness parameter</th>
<th>Examples of field tests</th>
<th>Examples of test either conducted in a laboratory or requiring specialized equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aerobic Power</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Maximal tests</td>
<td>1. Time to cover a specific distance</td>
<td>1. Continuous tests</td>
</tr>
<tr>
<td></td>
<td>2. Distance covered in specific period</td>
<td>Maximum oxygen uptake obtained during a continues progressively increased workload test using a specific exercise modality.</td>
</tr>
<tr>
<td></td>
<td>3. Time taken, or distance covered, in a shuttle run to exhaustion, with incremental speed increase at specified time intervals.</td>
<td>a. Ramp test with workload continuously increasing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Test with specific workload increase at specific time intervals</td>
</tr>
<tr>
<td>(b) Sub maximal tests</td>
<td>1. Recovery heart rate following specific height bench stepping at a specific rate for a specific period.</td>
<td>2. Discontinuous tests</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Like 1b except that specific recovery periods are interspersed between exercise stages</td>
</tr>
<tr>
<td><strong>Anaerobic Power</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Peak anaerobic power</td>
<td>1. Vertical jump height</td>
<td>1. Peak power output usually recorded in W or W/kg either per 1s or 5s obtained during all-out exercise lasting 5s to 10s.</td>
</tr>
<tr>
<td></td>
<td>2. Standing broad jump distance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Timed short, specific distance sprints in which time to completion is usually in the 5s to 10 s ranges.</td>
<td></td>
</tr>
<tr>
<td>(b) Mean anaerobic power</td>
<td>1. Specific-distance sprints in which time to completion is usually within the 30s to 60s range.</td>
<td>1. Mean power output, usually recorded in W or W/kg obtained during all-out exercise over a 20s to 60s period.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Oxygen deficit achieved during all-out exercise over 20s to 30s periods.</td>
</tr>
</tbody>
</table>

Cont.........
<table>
<thead>
<tr>
<th>Fitness parameter</th>
<th>Examples of field tests</th>
<th>Examples of tests either conducted in a laboratory or requiring specialized equipment</th>
</tr>
</thead>
</table>
| Body composition  | 1. Estimates of percent body fat from circumference measurements  
2. Body height, weight, and frame size. | 1. Skin fold measurement  
2. Underwater weighing  
3. Air displacement plethysmography  
4. Bioelectrical impedance  
5. Ultrasound  
6. Magnetic resonance imaging and computed tomography. |
| Flexibility       | 1. Linear measurement from one body segment or specific identified site to another or to an external object. | 1. Use of goniometer and inclinometer to measure range of motion in degrees. |
| Muscular strength | 1. 1RM measurement  
2. Use of muscular strength to overcome gravitational resistance of body or body part. | 1. Isometric strength measurement using a cable tensiometer or dynamometer  
2. Isometric, isotonic, and isokinetic measurement of strength using force transducers or load cells, and strain gauges. |
| Muscular endurance| 1. Number of repetitions completed using a specific weight resistance or a percentage (e.g. 70%) of 1RM.  
2. Time to maintain a specific weight or percentage of 1RM in a set position  
3. Number of repetitions that can be completed against gravitational pull on body or body part. | 1. Measurement of isokinetic endurance by measurement of number of maximum effort contraction that can be made before maximum force drops below a specific percentage (e.g. 70%) of maximum.  
2. Time that a specific muscle group can maintain a joint at a specific angle using a percentage of maximum (e.g. 70%) force as the load. |
1.6.6 Motor Ability Test

During the 1920s it was hypothesized that ability to perform motor tasks was an inherent characteristic much like intelligence. Brace, in 1927, was one of the earliest researchers to develop such a test battery, comprising 20 different stunts designed to evaluate inherent motor skill, ability. In 1929, Cozens published a test that purported to identify general athletic ability. This was followed by Shonson’s test in 1932 used to evaluate native neuromuscular skill capacity. Mcclroy, published a modification of the Brace test in 1937. Felishe, 1964, used two-classification system to describe motor abilities, one consisting of perceptual motor abilities and the other of physical proficiencies. His tests of perceptual motor ability consisted of 11 items: Control precision, multi-limb coordination, response orientation, reaction time, speed of arm movement, rate control (timing) manual dexterity, finger deterring, are-hand steadiness, wrist-finger speed, and aiming. The physical proficiency battery included extent flexibility, dynamic flexibility, static strength, dynamic strength, explosive, trunk strength, gross body coordination, equilibrium and stamina. (Fleshman 1975).

Baumgartner, Jacekson, Mahar and Rowe, argued that physical testing and program for development of fitness should emphasize the relationship between health and Physical activity. Physical fitness is a multi-faceted continuum that is affected by physical activity.

The schools should be on the forefront of such program and especially the physical evaluation sector can play a very important role in raising public awareness about the value of regular exercise, being physical active throughout life and providing information on how properly can look after themselves.

In fact, Almond stated that the physical education profession could play an important role in raising public consciousness about the value of exercise being physically active as part of one’s life style and providing access to ways in which people can look after themselves. Fox and Biddle⁴⁸ (1984) grouped the reasons

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⁴⁸ Fox, & Biddle, S. (1984). Health Related Fitness in Schools. In Bulletin of physical Education. 20,4
for testing under three educational objectives: Providing fitness information for students, motivating students to maintain or improve their fitness and teaching students the concepts and principles of health related fitness.

Aquilina (1988) identified several reasons for fitness testing. The latter can help in:

- Keeping track of the children’s progress.
- Designing programs according to the children’s strength and weakness.
- Placing children according to ability and levels of functioning.
- Motivating children in maintaining or enhancing their own level of fitness.
- Promoting physical education.
- Evaluation of physical education programs.

Pate49 argued that tests can be effective in promoting the fitness of children when a set number of conditions are adhered, namely:

- Fitness must be integrated into the curriculum and used as pedagogical tool.
- Testing should be only one component of comprehensive fitness education program.
- Fitness tests must be administered in a caring, sensitive and positive manner.
- Fitness testing should emphasize health-related fitness.
- Results of fitness tests must be interpreted for students and parents in a meaningful way.
- If reward systems are used, they must be motivating for all students.

1.7.6 Test Batteries

Several organizations have grouped fitness tests together in a test battery. These test batteries and their documentation provide the ability to administer reliable and valid tests, interpret the results and convey information to the program participants. Validity and reliability are important criteria of a test, but administrative efficiency may place one test ahead of another. Validity however is the weak point in most physical fitness tests today. Not all physical fitness tests

battery measure the same kind of physical fitness. Therefore, when selecting a
fitness test battery it is necessary to select one that measures the kind of fitness
the program is aiming to achieve.

The AAHPER youth fitness test was a dominant test battery between 1950s
and 1980. Its objective was to test motor fitness and its test items included traits
specific to athletic performance rather than fitness as it relates to normal day-to-
day life (Pate 1994). The assessment of physical fitness has moved from motor
fitness emphasis to a Health related emphasis. The objectives of the test batteries
underwent changes as well. They are closer to a more educational aspect of health
and fitness. Several different test batteries will now be compared with each other.
A number of these test batteries will be compared with Eurofit test battery.

- AAHPER Youth fitness test (1965)
- Basic fitness test (Fleshman 1964)
- Standard fitness test (Kirsch 1968)
- International physical fitness test (1977)
- AAHPERD physical best
- AAHPERD health related physical fitness test (1980)
- President’s challenge
- YMCA youth fitness test
- Chrysler Fund / AAU
- Moper fitness test (1980)
- Fitness Gram
- Euro fit test (1983)

Tables are being used to illustrate the similarities and differences between
test batteries. Some of the components of physical fitness have been compared.

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Table 1.4 Fitness tests-components and test items

<table>
<thead>
<tr>
<th>Fitness Tests</th>
<th>Fitness-related factors</th>
<th>Methods of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Endurance</td>
<td>Strength</td>
</tr>
<tr>
<td>Basic Fitness Test (Pleishman 1961)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>AAHPER-Youth Fitness Test (AAHPER 1965)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Standard Fitness Test (vgl. Kirsch 1968)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>International Physical Fitness Test (USDA/WHO 1977)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Representative Testbattery (Stemmler 1978)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>AAHPERD Health Related Physical Fitness Test (AAHPER 1980)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MOFE Fitness Test (BOVENDE EERDT/KEMPER/VERSCHUUR 1980)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>EUROFIT (CDOS 1953)</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
### Table 1.5

Test measuring cardio respiratory Endurance

<table>
<thead>
<tr>
<th>Test Battery</th>
<th>Test Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurofit Test Battery</td>
<td>Endurance shuttle run</td>
</tr>
<tr>
<td>AAHPERD Youth fitness</td>
<td>600 yard run-walk or mile run-walk</td>
</tr>
<tr>
<td>AAHPERD Physical Best</td>
<td>One mile walk-run</td>
</tr>
<tr>
<td>Fitness Gram</td>
<td>One mile run walk or multistage 20 m shuttle run</td>
</tr>
<tr>
<td>President’s Challenge</td>
<td>One mile run-walk</td>
</tr>
<tr>
<td>YMCA Youth Fitness Test</td>
<td>One mile run</td>
</tr>
<tr>
<td>Chrysler Fund /AAU Test</td>
<td>One fourth mile or one mile depending on age</td>
</tr>
</tbody>
</table>

### Table 1.6

Tests measuring Anaerobic power

<table>
<thead>
<tr>
<th>Test Battery</th>
<th>Test Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurofit Test Battery</td>
<td>Standing broad jump</td>
</tr>
<tr>
<td>AAHPERD Youth Fitness</td>
<td>Standing broad jump</td>
</tr>
<tr>
<td>AAHPERD Physical Best</td>
<td>Not tested</td>
</tr>
<tr>
<td>Fitness Gram</td>
<td>Not tested</td>
</tr>
<tr>
<td>President’s Challenge</td>
<td>Not tested</td>
</tr>
<tr>
<td>YMCA Youth Fitness Test</td>
<td>Not tested</td>
</tr>
<tr>
<td>Chrysler Fund /AAU Test</td>
<td>Not tested</td>
</tr>
</tbody>
</table>
Table 1.7  
Tests measuring Body Composition

<table>
<thead>
<tr>
<th>Test Batteries</th>
<th>Test Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurofit Test Battery</td>
<td>Skinfold measurement of triceps and calf</td>
</tr>
<tr>
<td>AAHPERD Youth Fitness</td>
<td>Not tested</td>
</tr>
<tr>
<td>AAHPERD Physical Best</td>
<td>Sum of triceps and calf skinfold</td>
</tr>
<tr>
<td>Fitness Gram</td>
<td>Sum of triceps and calf skinfolds or body mass index</td>
</tr>
<tr>
<td>President’s Challenge</td>
<td>Not tested</td>
</tr>
<tr>
<td>YMCA Youth Fitness Test</td>
<td>Sum of triceps and calf skinfolds</td>
</tr>
<tr>
<td>Chrysler Fund /AAU Test</td>
<td>Not tested</td>
</tr>
</tbody>
</table>

Table 1.8  
Tests measuring Flexibility

<table>
<thead>
<tr>
<th>Tests Batteries</th>
<th>Test Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurofit Test Battery</td>
<td>Sit and reach</td>
</tr>
<tr>
<td>AAHPERD Youth Fitness</td>
<td>Not tested</td>
</tr>
<tr>
<td>AAHPERD Physical Best</td>
<td>Sit and reach</td>
</tr>
<tr>
<td>Fitness Gram</td>
<td>Sit and reach or shoulder stretch</td>
</tr>
<tr>
<td>President’s Challenge</td>
<td>V sit and reach or sit and reach</td>
</tr>
<tr>
<td>YMCA Youth Fitness Test</td>
<td>Sit and reach</td>
</tr>
<tr>
<td>Chrysler Fund /AAU Test</td>
<td>Sit and reach</td>
</tr>
</tbody>
</table>
1.7 Euro it Test Battery

The outcome of several years co-coordinated European research into along felt need the identification or development if necessary of effective means of accurately assessing physical fitness in children appropriate to school and survey use. Three main reasons have inspired the creation of Eurofit:\(^5\)

- Physical fitness is an important component of health and physical education.

Physical education is one of the subjects which all children are required to do at school. To physically fit is not just a help to sport and physical education it is also a major factor in leading a happier and fuller life. Eurofit tests shown that they have many important users:

In a relatively short time, they can yield a great deal of new descriptive information. On the basis of which attitudes and policies concerning the condition of children can be based.

For the individual child, the measurement of fitness can be help to develop a positive attitude to the body, enable him/her to achieve a self-awareness of his/her Physical state, encourage parents to become actively interested and involved in the statues of their children’s physical fitness.

The test may reveal individual or group deficiencies in health, the Eurofit tests can also be modified or use with disable children, including mentally handicapped children.

- Assessment of physical fitness is of value to educators and children.

Physical fitness has suffered in the past from the difficulty of assessing its many components accurately and objectively. The Eurofit tests are sensitive individual and reliable instruments for assessing its various principle dimensions through the Eurofit also been used successfully with later age groups.

- Eurofit is a contribution to education.

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Understanding and acquiring physical fitness is only a part of physical education, while it is an integral part of education in general. All those involved with health, sport and physical education including of course principally, physical education teachers, will have direct interest in Eurofit, but Eurofit should and must go beyond the strict confine of the physical education lesson, and help reinforce the place of physical education in schools. One of the prime objectives of Eurofit is to enable common data to be collected so that scientific conclusion can be from them.

1.7.1 The origin and development of Eurofit

The need for testing physical fitness and establishing reference data for European School children was first recognized in 1977 at the meeting of the directors of sport research institutes. The principal aims of this project were to:

- Establish a commonly agreed test battery in Europe.
- Help teachers assess the physical fitness of the pupils in school.
- Help in measuring the health-related fitness of the population.

In order to realize these aims, a series of European research seminars on testing physical fitness was organized under the aegis of the committee for the development of sport. The objectives of first seminar, which took place in Paris (OCT 1978) was to discuss the philosophy and to review the methods of investigating physical fitness in school children. They have agreed on the elements and basic dimensions of physical fitness as necessary components of well-being, which were:

- Structural factors: height, weight and body fat
- Functional factors: Cardio respiratory endurance, muscular strength (static, dynamic) flexibility and speed (running and segmentary)
- Coordination
The second seminar was organized by the department of physical education at the University of Birmingham in June 1980 and discussed the evaluation of cardio-respiratory endurance and identified a number of tests to be developed or evaluate for that purposes. They have agreed that bicycle ergometer and recording heart rate is the best available simple field laboratory test for estimating cardio respiratory endurance in School children. The third seminar was organized by the institute of physical education of Catholic university of Leuven in Belgium (May 1981). They discuss the dimension of motor fitness and agreed on the contents and the test procedures of an appropriate set of tests. For three factors, a second test was added.

The fourth seminar was held at ancient Olympic organized with the help of international Olympic academy and by the sport research institute of Hellenic Olympic committee in order to decide on a field test for mass situations for cardio respiratory endurance test. As results of these four research seminars, the committee of experts approved a complete experimental Eurofit test battery with ten tests three alternatives and two possible indoor tests for measuring cardio respiratory endurance.

As results of these four research seminars, the committee of experts approved a complete experimental Eurofit test battery with ten tests three alternatives and two possible indoor tests for measuring cardio respiratory endurance. Over 50,000 School children in Europe in 16 member states have been tested. At the last seminar, which organized by Italian national Olympic committee, they evaluated their experiences with the experimental tests and established final testing instruments.
1.7.2 Selection and justification for the Eurofit tests.

Physical fitness is a multidimensional concept so it is not surprising that defining selecting its parameters have a long and complex history. One of the main objectives of the European research seminars on Eurofit was indeed to identify its basic dimensions. The criteria agreed for selecting Eurofit tests were as follows:

They should be well described, and used with large numbers of children of both sexes.

Their internal (construct) validity should be established by means of factors analysis in order to ensure independent parameters and to select the most appropriate test for each dimension and factor of physical fitness.

Their external (concurrent) validity should be demonstrated, they have shown to be effective descriptors of levels of fitness in normal populations and to differentiate between varying groups.

Their reliability and objectivity measures had to be high. This was checked through test –retest procedures and comparing the scores given by different test administrators. Finally, in addition to their suitability for survey purposes in large scale projects, the tests had to be practical and applicable in school or club situations. This led to the final selection of 10 tests, measuring six dimensions and nine factors of physical fitness, to which personal measurements and identification data were added, the table below shows nine components, which contribute to physical fitness.
1.7.3 Rational

The concepts of physical fitness can be divided into three major constituents: Organic, motor and cultural\(^{53}\) (Fig 1.3). The organic dimension, which linked to

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the individual Physique concerns, the processes of energy production and work output. This dimension of fitness, the one most directly related to health is represented in Eurofit by a choice of cardio-respiratory endurance 20m shuttle run test. This test can be easily administered in schools either indoors or outdoors. The motor dimension of physical fitness concerns the development of psychomotor capacities required for the control of measurement, and of muscular skills in order to carry out some motor tasks.

The Eurofit tests provide relevant information on an individual’s basic motor abilities. All the tests have shown their validity in differentiating for example, physically active youngsters from non-active ones or between sports participants from different sports. The cultural dimension is the tired fact of the physical fitness trad. It refers to and reflects the influence of such factors, as the situation of physical education in the school system or the accessibility of sports clubs and sport facilities.” sport for all” and “Eurofit “are perfect examples which illustrate the impact the cultural Components can have on the sport participation and the physical fitness status of large populations. As a consequence, the Eurofit tests should ideally be complemented with an evaluation of person’s involvement in physical activities.
1.8 Physical Education

The word physical refers to the body. It is often used in references to various bodily characteristics, i.e. physical process, physical health and physical appearance. It refers to the body as contrasted to the mind. Therefore when the word education is added to the word physical, this forming the phrase physical education, which refers to the process of education that concerns activities that develop and maintain the human body. Physical education helps or inhabits the attainments of education objectives will depend greatly on the leadership responsible for its direction.
Physical education is one phase of the total education process and it utilized activities which are essential for each individual in order to develop a person organically, neuromuscular, intellectually and emotionally. These outcomes are realized whenever physical education is conducted in such places as the playground, gymnasium, track and swimming pool. Physical education and recreation are among the oldest arts in the humanities.

Physical education is a fundamental mode of human expression, and it is an essential from of non-verbal communication, as are music, art, literature and drama. In its broadest interpretation, physical education focuses on selected aspects of human experience that are described as the art and science of voluntary, purposeful human movement. Although physical education encompasses all of the man’s movement, its studies and program are concentrated in areas of movement designed by such terms as dance, sports, aquatics, gymnastics, and designed exercise. The term “Physical education” evolved in American in the early 1900s from the more restrictive label. "Physical training” “physical education” became a general accepted term in schools and colleges in this country in the first half of the twentieth century.

Since World War II, professional educators have increased their efforts to correct the limited and inaccurate concept implied by the assumed mind body dichotomy and has sought to interpret physical education as a program concerned with the development and learning of the complete human being.

A recent elaboration in the conception of the nature and scope of physical education developed in the early 1960s. Movement as dynamic function of man “is often identified as the area of central concern which gives physical education its unique identity. Metheny, indicates that study and research in physical education is direct toward understanding man, with particular reference to his ability to move, the ways in which he utilizes this ability, and the ways in which his use of this ability are related to other aspects of his functional organization as a whole.

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person, and is in some way related to every aspect of man’s being and behavior. When we consider education in such fundamental terms, we are drawn logically to the conclusion that physical education should be defined as 55: “Phase of the total process of education which is concerned with the development and utilization of the individual’s movement potential and related responses, and with the stable behavior modification in the individual which result from these responses.”

Physical education (PE) is a sequential, developmentally appropriate K to 12 Curriculum and instruction that promotes lifelong physical activity. It helps students to develop the knowledge, motor skills, self-management skills, social skills, attitudes and confidence needed to adopt and maintain physical activity throughout their lives. Physical education is an integral part of the educational process and contributes to the physical, intellectual, social and spiritual development of every student.

The mission of physical education in school is the development of autonomous learners who readily participate in meaningful physical activity on a regular basis. Researchers have shown a positive link between regular physical activity, enhanced self-concept and quality of life. Through physical education program in schools, teachers can educate and excite students about pursuing active, healthy lifestyles. Teachers can help students realize the benefits of physical fitness activities and understand the concepts they will use to develop personal programs. Through physical education programs students will understand the importance of living what they have learned. Participation in physical education gives students the opportunity to live what they have learned.

The benefits of physical education include:

- Increased fitness level
- Improved motor development

Tendency towards active life style

Positive correlation between the learning of physical and mental skills.

Increased performance in other subjects, even though less time is spending on those subjects.

Increased attentiveness and alertness throughout the school day.

Long term improvement in the body image.

1.8.1 Physical Education Program

1.8.1.1 Aim

The conceptual framework of physical education purposes logical evolves from the ultimate purpose toward which physical education is directed. One can readily locate a diversity of statements aims described in the following ways: "to train the mind, to develop the intellect, to master prescribed bodies of knowledge, to learn the basic concepts of selected disciplines, to develop the character, to develop the human potentialities of the individual so he will become an effective, participating member of a democratic society, to develop the rational powers, to develop the ability to think, to develop the capacity to make wise decision in order to become an effective citizen in the democratic processes upon which this free country depends, and, to learn to learn for a lifetime.

statement of purposes of physical education found in recent literature quite generally agree on the importance of providing favorable opportunities in school programs for individuals to engage in selected kinds of human movements and related activities, which are voluntary, purposeful, and overtly observable. Following this line of reasoning, we may define the aim of physical education as follows: organized physical education aims to make the maximal contribution to the optimal development of the individual’s potentialities in all phases of life, by

placing him/her in an environment which will promote the movement and related responses or activities that will best contribute to this purpose."

- Goals and Objectives

Goals of the physical education program are:

- Concept–based skill development
- Development of positive attitudes

These attitudes will focus on:

- Physical activity
- Fitness
- Self–concept
- Relationship with others
- Social behavior
- Personal and group safety.

Innumerable books, pamphlets, curriculum guides, and magazine articles contain descriptions of broad physical education objectives. It is startling and instructive to construct a long list of physical education objectives from these sources and to categorize each under various headings. In order to do that, we categorized the objectives as follows:

- General Objectives; the following general objectives of physical education are:
  - To develop a basic understanding and appreciation of human movement.
  - To develop and maintain optimal individual muscular strength, muscular endurance, and cardiovascular endurance. It is customary to refer to this purpose as the "physical fitness".
  - To develop individual movement potentialities to the optimal level for each person.
• To develop skills, knowledge, and attitudes essential to satisfying, enjoyable, physical recreation experiences engaged in voluntarily throughout one's lifetime.
• To develop socially acceptable and personally rewarding behaviors participation in movement activities.

1.8.2.2 Instructional Objectives

The term instructional objectives have come into prominence with the refocus of emphasis on the consequences of instruction or the result teacher achieve in charging Pupil behaviors. Popham says: An instructional objective stated in performance, behavioral, or measurable terms is simply an assertion of what you want to happen to learners as a consequence of instruction. This statement implies that teacher must describe a learner’s probable behavior at the end of the unit immeasurable terms.

1.8.3.3 Behavioral and performance Objectives

In order to state a behavioral objective clearly while planning a teaching unit, the instructor must have considered carefully what the overt behavior of the pupil will be when he has mastered that particular objective. Mager calls this the “terminal” behavior. The description includes not only what the pupil can do or perform in observable ways, but also states the conditions under which the behavior is to be elicited, and an acceptable level of performance of the behavior.

1.8.4.4 Expressive Objective

Eisner clarifies the nature of expressive objectives as follows. This type of objective describes an educational experience such as a problem to solve, a project to be planned and carried out, or poem or painting to be created. Expressive

objectives interpret, extend and modify the: known’ and sometimes create something which is completely new.

Physical education programs endeavor to equip all students, regardless of gender, race, cultural background or ability, with the physical skills and social attitudes necessary to reach their maximum potential. Physical education should be presented in palatable and interesting manner. Students should receive joy and satisfaction from participating in the various activities. Physical education carries its own drive and the teacher should attempt to preserve this natural drive throughout childhood years into adulthood.

It has been said that if children were exposed to good physical education programs during their formative years, there would be no necessary for required physical education programs in latter school years. Physical education is distinct from recess, recreation and athletics. Physical education has unique role for all children, while athletics and recreation serve only some children. Races provide an opportunity for physical activity and unstructured play and compliments physical education. Physical education is evaluated by the following criteria: ‘all, quality, daily knowledge, skill, confidence. All refers to students and includes the range of ability from athletes to those with special needs.

Quality refers to the resources available including a specialist, certified teacher (trained specifically to teach physical education at the grade level), equipment and facilities, and appropriate student to teacher ratios (similar to other academic classes in the school and planned program of the instruction and activity for all students through the entire school year. Quality physical education programs are essential in helping students gain competence and confidence in a variety of movement forms such as, dance, gymnastics, recreational and activities.

Quality physical education is the cornerstone of school’s physical activity programming, and well-written physical education curriculum is the foundation of physical education program. Appropriate actions must be taken in four main areas to ensure a high quality physical education program.
1) Curriculum 2) policies and environment 3) Instruction, 4) Student assessment Policy and environment actions that support high quality physical education require following:

- Adequate instructional time (at least 150 minutes per week for elementary school students and 225 minutes per week for middle and high school students).
- All classes must be taught by qualified physical education specialist.
- Reasonable class sizes.
- Proper equipment and facilities.

Instructional strategies that support high quality physical education emphasize the following:

- The need for inclusion of all students.
- Adaptations for students with disabilities.
- Opportunities to be physically active most of the class time.
- Well-designed lessons - not using physical activity as punishment.

Regular student assessment within a high quality physical education program features the following:

- Assessment tools.
- Ongoing opportunities for students to conduct self-assessments and practice.
- Communication with students and parents about assessment results.
- Clarity concerning the element, used for determines a grading or student proficiency system.

It should provide a sound framework for the design and assessment that develop the students’ motivation, fitness, cognitive, affective behavioral, and Active life style needs, and should focus on life –time involvement. Benefits of such quality programs are:

- Students display positive attitudes towards an active life style.
- Exhibit better health habits (tend not to smoke)
- Students develop personal physical fitness, and enhance bone growth.

• Exhibit more positive attitudes about school, physical activity and self
• To provide for safe physical environment
• To provide students with variety of activities that will enhance life-long learning and participation.
• Promote physical excellence.

The required physical education cannot be conducted in a hit and miss fashion. It must be planned in accordance with the needs and interest of the individual it serve.

Some of the initial conditions in planning and developing a physical education program are suggested here:
• The needs of the individual and of society, as reflected in the objectives of physical education represent a main consideration in the establishment of a program of physical education.
• Physical education should recognize the importance of coeducational activities for social growth and provide for them in the program.
• Provisions should be made so that all individuals may participate in and benefit from the physical education program.
• Qualified leadership is an essential in all phases of the PE program.
• Physical education should be planned, organized, and conducted in a manner which will exploit the educative possibilities to the fullest.
• Physical education should contribute to the democratic way of life.
• The program should include a wide variety of activities which can be engaged in by all individuals, indoor, and outdoor and which meet safety, hygienic and social standard.
1.9 Statement of the Problem.

The problem can be stated as: Study and comparison physical capabilities of high school students of Pune (India) and Shiraz (Iran) cities and its relation with quality of physical education program is the matter of the study. The present investigation is an endeavor to identify the factors which are responsible for this relationship of physical fitness and quality of program. In this study researcher wants to compare physical fitness and motor fitness in context between Iran and India. The investigator included high school students of Shiraz and Pune cities in this study and hence the statement of the study is as follow: A comparative study of physical fitness of high school students of Pune (India) and Shiraz (Iran) cities and its relation to the quality of physical education program.

1.10 Objectives of the Study

Keeping in view the need, background and purpose of the study, the researcher has conducted this study with the following objectives:

1. To measure the physical fitness variables of high school students of Pune (India) and Shiraz (Iran) cities.
2. To compare the physical fitness of high school students of Pune (India) and Shiraz (Iran) cities.
3. To compare the anthropometric characteristics of high school students of Pune (India) and Shiraz (Iran) cities.
4. To find out a relationship between physical fitness and quality of physical education program.

1.11 Limitations

The researcher has recorded the shortcomings, while conducting the study. However, the researcher has made him aware of the following problems.

1. The factors such as diet, mental and psychological status could not be possible to control.
2. Sport background, motivation and cultural life could not be controlled in both Indian and Iranian context.
3. Since the test items are many, the researcher could not be able to control all measurements single handedly, therefore help from the professional and qualified assistants was necessary.

4. The geographical areas of this study are exclusively confined to high school students of Pune (India) and Shiraz (Iran) cities.

1.12 Null Hypotheses

On the basis of the literature reviewed, the present investigator has formulated the following hypotheses:

$H_01$: There is no significant difference between physical fitness level of high school students of Pune (India) and Shiraz (Iran) cities.

$H_02$: There is no significant difference in the anthropometric characteristic of high school students of Pune (India) and Shiraz (Iran) cities.

$H_03$: There is no significant relationship between physical fitness level and quality of physical education program in both cities.

Alternative Hypotheses:

H1: There is a significant difference between physical fitness level of high school students of Pune (India) and Shiraz (Iran) cities.

H2: There is a significant difference between anthropometric characteristic of high school students of Pune (India) and Shiraz (Iran) cities.

H3: There is a significant relationship of physical fitness level and quality of physical education program in both cities of Shiraz (Iran) and Pune (India).

1.13 Delimitations

Since during any investigation, investigator is faced with some limitation such as time, financial and also availability to resources; therefore researcher decide to delimit this study as follows:

1. This study was delimited to 15-18 years old boys.
2. This study was delimited to the high school students of Pune (India) and Shiraz (Iran) cities.

3. This study was delimited to following physical fitness components tested in:

<table>
<thead>
<tr>
<th>Muscular strength</th>
<th>Static strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexibility</td>
<td>Anthropometric measure</td>
</tr>
</tbody>
</table>

   | Cardio respiratory endurance | Body composition |

4. This study was delimited to the following motor fitness components tested in:

   Running speed  Balance  Speed of Limb movement  Explosive strength

1.14 Operational definition of the term Used

In every research, there are some words which must be understand by every reader; therefore the following terms pertinent to the study are defined for the classification of succeeding discussion.

1. Anthropometry: The measurement of the size and proportion of the human body and its different parts. In this study, these indexes are included weight and body fat % and height.

2. Weight: It is mass of the body, as measured by with the help of weighing machine is recorded nearest to tenth of kilogram.

3. Body fat: Fat percentage is an estimate of the fraction of the total body mass that fat mass as opposed to lean body mass.

4. Physical fitness: is the capacity of the students to meet the present and potential physical challenges of given tests. The components of physical fitness which are included in the Eurofit are:

5. Muscular strength: is the ability of the students to repeat muscular force against a sub maximal resistance or body weight in given test.

6. Muscular endurance: It is the application of repeated muscular force against a sub maximal resistance.
7. **Cardiovascular endurance:** It is the ability of the students to sustain or continue activity in endurance shuttle 20 meter run test.

8. **Flexibility:** It is the ability of students to move their joints in maximum range or movements possible in given test.

9. **Power:** The capacity to produce the greatest amount of force in the shortest possible time. (Bompa 2006)

10. **Balance:** is the ability of the students to maintaining control of one’s own center of gravity while doing the test.

11. **Speed:** The ability of the students to make their body or parts of the body through a given range of motion in the least time in a given test.

12. **Agility:** refers to the ability of the students to swiftly accelerate and decelerate movements quickly and change the directions rapidly in given test.

13. **Body composition:** relates to the relative amounts of muscle, fat, bone and other vital parts of body.

14. **Body mass index:** It is defined as the weight (kg) divided by the square of the height (m). BMI = body weight (kg)/ height (m)²

15. **Quality of physical education program:** Here means the theoretical and practical knowledge of physical education teachers/coaches to train for improving skills and fitness for optimizing performance and also about the sport facilities.

16. **Physical education program:** here means the number of lessons that organized in the whole course.

17. **Shiraz City Students: (SHCS):** Boys students enrolled in the high schools in Pune city.

18. **Pune city Students: (PUCS):** Boys students enrolled in the high schools in Pune city.