



## Physical Fitness and Its Influential Factors

Rudra Prasanna  
Mohapatra

Assistant Secretary, Bhubaneswar Boxing Association, Odisha, India

### ABSTRACT

*Physical fitness is the ability to meet the demands of life with vigour and alertness, without undue fatigue and to have sufficient energy; beyond this to enjoy leisure time activities and meet unexpected emergencies. Due to the vast scope of physical fitness and its components in a number of areas, it is not advisable to categorise it into a rigid frame work.*

*Therefore, physical fitness has been defined differently, implying such concepts as muscular effort where quality and intensity are involved, the ability to handle the body well, and possessing such components as speed, strength, endurance, agility and coordination.*

### Key words :

#### Physical Fitness: Components

Physical fitness has two major components namely **Health Related Fitness** and **Motor Fitness**. The former relates to the processes of *energy production* and *work output* by the human body and comprises strength, cardio-respiratory endurance and flexibility as components, the latter relates to development and performance of motor or movement skills comprising agility, speed and balance. These two sorts of physical fitness are not mutually exclusive as they have certain elements in common e.g. muscular strength, endurance, flexibility and cardio-respiratory fitness of an individual collectively determine one's ability to perform motor skills.

Physical fitness activities are at the core of physical performance and comprise an integral part of the developing child's behaviour. It is largely through the medium of physical activities that a child interacts with its environment especially during the first decade in his life. Assessment of physical fitness in children, therefore, a prime concern. An extensive relationship exists between childhood, physical activities and fitness level at adulthood. Importance of children's physical fitness is indispensable for strengthening of the nation. Awareness and education on physical fitness shall lead to physical, mental, spiritual and social fitness of a nation (e.g. Republic of China). In India, despite compulsory provision of physical education at school level, unsatisfactory performance in international sports meet indicate lack of sincere attachment towards physical education among adolescents and youths.

A multifactorial approach is essential for deep understanding of physical fitness as human activities are controlled by socio-cultural parameters. Performers and their performances in various skills can be treated either in a purely biological or purely cultural manner. Apart from biological capacity of children, the socio-cultural factors influencing physical fitness include culturally determined habits, attitudes and behavioural patterns. It is essential to realise that whatever talents worth a child may have they can be expressed only the limit set forth by his socio-cultural milieu.

#### Physical Fitness: Influential Factors

It shouldn't be confused from the name that physical fitness only influences by the physique or Biological aspects of human body. It is a proven fact (as described earlier) that cultural factors and some intermediate factors (intermingle of bio-cultural segments) are equally responsible for the physical fitness of an individual. Below is the elaborate expression of these factors.

#### Biological Factors affecting Physical Fitness: Ethnicity and Physical Fitness

It is a predetermined fact that physical fitness is being highly influenced by ethnicity. Ethnicity is supposed to be greatly associated with genetics. So it is often said that physical fitness is also genetically determined. Physical fitness has a tendency of variation with due regard to the ethnic elements in the population. It can very well be evident from an example that the physical fitness varies among *Jats* (Ethnic group of north India especially Haryana) than that of Kashmiri Brah-

mins. It is only because of the fact that the fitness capacity is highly influenced by the somatotypes (discussed later) which refers more or less to ethnic element. Analysing the ethnic elements at global level, Negroids have a tendency to be motor fitness and Mongoloid exhibits a better form of balance. However, it doesn't always necessarily means that regular practice can make a difference without generic privilege. The fact can't be denied that regular involvement in fitness activities, backed by genetic advantages can only deliver the best performance.

#### Body Fat Mass and Physical Fitness:

Fat Free Mass (FFM) is calculated for the estimation of the physical activities. After the adolescent period, the boys specially has a tendency to reduce the fat composition; but it is not true in case of girls, as females need fat as a prime component of their bodies. This fat deposition in their bodies lay a pivotal role in ovulation during oogenesis and also helps in maintenance of some other body bio-chemical body functions.

Fat has a tendency of more deposition in the body in resting time and also has a reverse tendency during workout. This can be marked if test as Sheldon conducted to determine Somatotype have been taken place. The reduction of fat is resting period after workout period can be well marked from the sub-cutaneous fat of body (marked through skin fold thickness). Hence, Fat Mass (FM) is directly and predominantly influenced by physical activities leading the body to a Fat Free Mass (FFM).

**Fat Mass → Prolonged Physical Activities → Fat Free Mass**

#### Central Body Fat Deposition (CBFD)

This is the approach where the fat mass of the body can very well be determined as this adds as a prime component to the Body Fat Mass. Central Body Fat Deposition (CBFD) refers to the deposition adipose tissues around the waist. In fact, the adipose tissues are stored the external oblique muscle (side belly muscle), lenia Alba (front belly muscle) and extend up to the hip region. This fat deposition is directly proportionate to the subcutaneous fat in the body. The more the subcutaneous fat, the more the CBFD. It is only because the fat deposition in the body occurs due to lack of activities as well as packing diets rich in fat or rich in calories. But the difference is that the 'Waist Circumference' determines the CBFD whereas skinfold thickness determines the subcutaneous fats.

#### Physical Fitness and Somatotypes

This approach is the prime concern of the present day sports scientists, in selecting the athletes, basically in New World. An individual's somatotype has a tremendous impact on the type of physical activities he can best be put into and also perform better, irrespective of daily training programmes. Somatotypes can broadly be categorised into *Ectomorphy*, *Mesomorphy* and *Endomorphy*.

*Ectomorphs* are individuals with linear body and narrow abdomen, not much body muscle composition nor even more fat (subcutaneous fat mass is very less). They have linear thin face, high forehead,

receding chin etc. An interesting fact about ectomorphs are that they are very sensitive in nature as they have a fine nervous system. These somatotypes have a privilege of better running, swimming, basketball than counterpart somatotypes. The linear physique helps there in maintaining a better balance and hence can be good sportsmen.

*Mesomorphs* are stout and short and slender body. Bone and muscle composition of the body is more. Besides, subcutaneous fat is also relatively less compared to endomorphs. Musculature is stoutly built. These somatotypes have cubical and massive shoulder indicating good musculature and also ironically termed as classical *Hercules Model* for their stout body construction. Mesomorphs are fit for muscle endurance games like bodybuilding, weight lifting or even wrestling.

*Endomorphs* are bulky bodied individuals having large spherical belly with a great amount of Central Body Fat Deposition (CBFD). They also exhibit an equal tendency in subcutaneous body fat. Hence, they possess a fatty body overall. These somatotypes, frankly speaking, are generally rejected for sports activities. But Sumo Fighting, popular in South-East Asia, China, Japan, endomorphs are preferred.

Now arise a question, Does these sports events refer to the somatotypes are unique to them or overlapping. Well, it is overlapping, provided a good exercise programme or fitness routine and recommended diets are being taken into account. But current studies reveal that, the determination of somatotypes is genetic and often come in association with the ethnic elements in the context of physical fitness. These somatotypes have differential anatomies as the recent study in medical science cleared out. These somatotypes generally exist in intermediate forms like mesomorphic-endomorph, endomorphic-ectomorphs etc. Thus it is hardly been found a typical somatotype that acts as the obstacle.

#### **Physical Fitness and Haemoglobin Level**

Haemoglobin as a matter of fact is a pivotal component of blood. The role of haemoglobin is to carry oxygen (O<sub>2</sub>) in blood. Simplifying the fact, more the level of haemoglobin in blood, more the oxygen the body gets. Oxygen helps to a great extent for the molecular oxidation and hence in metabolism. The better the level of oxygen, the enhanced the cardio-vascularity as the oxygen demands fulfil in proper amount and required timing. In generally speaking, a good level of haemoglobin necessarily indicates as healthy (physiologically) life. But so far as the matter of the tests for the estimation of the physical fitness concerned the study includes Harvard Step Tests (HST) that demands an enhanced cardio-vascularity as well as oxygen demand. Hence the fact that, the better level of haemoglobin a participant has necessarily supplementing the fact that the participant is going to perform well in these tests, of course, irrespective of the regular practice and training programme. However, for determining the cardio-vascularity or its endurance, haemoglobin estimation is the easiest one, although it demands a little more time than the anthropometry.

#### **Physical Fitness and Anthropometry**

It is a fact that hardly studies can be conditioned in physical anthropology proper, without the due consideration of the Anthropometry. Now it is only because, anthropometry throws light on the growth, body composition etc. and these are basic presumptions towards the participation in physical fitness programmes. Body composition in special reference to the fat deposition helps in presupposing the fitness level. The Body Mass Index (BMI) calculated with the help of height and weight is a prime essentiality for the performance.

#### **Physical Fitness and Body Composition**

The growth of adequate muscle also can be obtained from anthropometric data. It is an well-established fact that more the muscle, more the strength (especially static strength). A good built physique requires a well constituent muscle composition in the body. Fat in contrast to muscle, acts reversely. The more the fat the worse the activities level and vice-versa. Fat are adipose tissue whereas muscles are active tissue and constitute primarily of protein. Hence muscle composition throws on the activities level as well as nutritional status of the participants. Recent studies reveal that the more the muscle content in the body necessarily requires a well-built "anatomy". A slender built skeleton hence can be estimated from the muscle growth of the

body (a good level of calcium). Enhanced and stiff muscle in the body symbolises the fact that, the person is engaged in difficult activities for a long period of time. This also exhibits a very meagre amount of subcutaneous fat in the body. Hence it is the muscle that helps in performing physical activities in a better manner, not the fat. Hence, not only the height and weight (for Body Mass Index estimation) are essential, rather the body composition (fat, bone and muscle) is more required for estimating physical fitness.

#### **Physical Fitness and Body Size**

The saying goes "size does matter" may not hold good for the estimation of health related fitness. The size of the body can well be estimation from the Body Mass Index (BMI). The more the BMI the greater the size of the body (variation found in surface area in special reference to somatotype), but it may prove around if it can blindly be said that the bigger the body, the better the performance, irrespective of body composition, practices etc. Here the Muscle Fat Ratio practices does more matter than size.

#### **Physical Fitness and Genetics**

Is physical fitness genetic? This is the question that should always be answered with 'yes'. The gene determines the individual and the better the gene, the healthier the individual. Physical, Physiological features also primarily guided by genes at zygote level and ultimately determines the destiny of the body, that the individual is going to possess in due process of growth. We are also expected to observe a good level of difference among Punjabis and the South Indian children. This is only due to gene's play.

#### **Physical Fitness, Age and Sex**

Review of literature depicts that, the most of the studies conducted on physical fitness not in Indian subcontinent but also at the global level, were done in specific reference to growth or age and sex. Coming to the matter of discussion it is a fact that adolescent boys exhibit a good standard of interest in sports activity as well as running through the peak growth (adolescent spurt) of their lives. But the physical and psychic factors co-work at this state of growth, completely adequate for fitness oriented activities this may be the reason why in America, the sports stars were being selected at this phase of growth and also the same tendency is observed in European continents. The growth in physiology (organs and endocrine system) helps the boys to perform better. Although among the adults the growth is more matured but they lack the motivational factors that is responsible for the performance to a far extent. But the same tendency of games may lack among the girls at this phase due to pubertal or pre-pubertal period' But in childhood' they also exhibit a considerable interest in the field of sports. But the vital advantage of being opposite sex, girls enjoy certain physical privileges like more flexibility, balance and cardio-vascularity than boys, that helps them in performing certain components of motor fitness than boys.

#### **Physical Fitness and Body Physiology:**

It is sometimes being found that a person with good physique may not able to perform as expected. He/she either exhausting earlier or their bodies don't allow them to do so. Here, the reason may be clearly sited as the physiological one. This refers to the imbalances in the internal organ structure (Weak heart muscle leads to poor Harvard Step Test performance, although with teen physique or muscle weakness of some other organs like lungs, livers etc. 'Endocraniological' imbalances are often being found as the only cause of poor performances. Contemporarily, medical experts are associating the context of 'Anatomy' deeply with that physiology. They hardly stays apart from each other. The skeletal structure may exhibit some form of inadequacy towards the game the persons are opting for. Siting an example, persons having poor development in the lower and upper extremities may not well in running, swimming etc. but can be well proved against the game line lifting of weights. Hence, anatomy plays a core role for the performance of the physical fitness.

### **II. INTERMEDIATE FACTORS AFFECTING PHYSICAL FITNESS:**

Since long in the field of sports medicine, in idea was running down i.e. the biology determines the level of physical fitness. But later on cultural factors were also duly emphasized. Then comes the turns of Intermediate factors, those fall in between, not completely getting the status of biological agents or even cultural determinants.

**Micro environment**

This refers to the surrounding at familial state. This is going to determine the life of individual as individuals born in microenvironment first, and then introduced to the macro-environment. Microenvironment has so deep impact on its beholders that, even if on uncondusive macro environmental effect can be avoided. The primary training regarding familial history to that of society (socialization) is being accomplished in the micro environment. Frankly speaking this affects the attitude of the individual.

**Microenvironment:**

This refers to the outward surroundings that exceeds micro-environment. This refers more or less the ecological settings or eco- cultural environment. This is the spare where agents affects the individuals both in ecological (diseases) or cultural milieu. Diversity is the field for microenvironments in a biogeographical zones leads to the enhancement of microenvironment that vary biogeographical zones. This affects the 'character of the Person on a role serving for the long term basis.

**Health and Nutrition:**

This is the pivotal component in the intermediate factors affecting physical fitness. Health and nutrition more or less runs side by side. But recently good nutrition hardly leads to healthy conditions, rather obese conditions among aged (global problem). Health is physical, mental and social wellbeing (which hardly combined fulfilled) of individual as depicted by World Health Organization (WHO), USA. A good nutrition may serve the first component to health, but not the others too.

**Nutrition and performance**

Veg. Diet	Type of Strength	Non-Veg. Diet
+++	Static Strength	+++++
++++	Exclusive strength	+++++
++++	Functional Strength	+++

Sports Authority of India. (Journal -2003, January) (Additional Pluses for extra weight)

**Training and Acquired Skills**

There two factors are in fact important as the prime (sometimes termed as 'ultimate') factor influencing the physical fitness to a great extent. It doesn't matter, an individually biologically and nutritionally poor, but regular training practice can brings forward drastic change to perform. This is due to the fact that, the body is regularly acquainted with some type of work and hence performing it in a better manner day by day. Skill however, should be differentiated from training. Skill in more 'Inborn' than 'gained'. The skill gradually develop with the due course of regular training which may be previously remain hidden, the skill gets scope in the realm of regular training and gets developed, that ultimately leads to quite better performance.

**Attitude and Motivation**

Both these factors are more 'psychic' than physical but equally essential for the fitness. Attitude of an individual is that 'thought process' the individual proeses for a long span of time and of course subjective the positive attitude towards physical activities may supplement the performance whereas the reverse attitude may refers a lot participation in physical activities also. Motivation, on the other hand although a physic factor that of attitude, but is not the subjective one and more or less refers to a sudden change of the thought. This can create miracles. If motivated properly by somebody, then the mind call completely with the body that ultimately helps in excellent performance.

**III) CULTURAL FACTORS INFLUENCING PHYSICAL FITNESS**

**Familial Details and Fitness**

This Cultural Factors (social impact) helps to find out the family settings of the participants in physical fitness, as the details influence the individual to a great extent. Siting examples, the singer family (e.g. Mengheskar Family) has the credit to form many famous playback singer. Similarly, if in family minimum are physical workers or sports man the individual will better be motivated than the individual residing in a family where people hates physical activity.

**Educational Level**

Here the educational level of the individual concern is taken into account. The education here refer to the academic career of course not the physical education, the better the education the better the physical authorities and better proposes.

**Urbanization Level**

The urban people are said to be more carrying than the rural folks, but lack physical activities or almost late preparing activities. Hence, the urbanization levels runs in contract to the performance of physical activities.

**Occupational Data**

Occupation guides the economy, the better the economy, the better the living conditions. But here the matter of concern is that, whether occupation of the individual indices any most of physical activities or not. For example, an agriculture in supposed to be more physicaly fit, than the teacher. Among offer is more energetic than Revenue Officers, although the income about remains the same. Hence occupation as a regular part of life has tremendous effect on physical activities.

**Conclusion**

Hence from the aforesaid discussion we find that physical fitness has influencing factors, not only biological or even social rather some intermediate factors, more being said, found those equally influence the standard of physical fitness. Then it is clear that fitness should be estimated as taking all these factors into account for an amount estimation.