CHAPTER - I

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Physical activities and games, though very crude, were in vogue in ancient times for the development of man. In those days, the emphasis was on increasing physical strength and life span, survival, ascendency over a rival and exhibiting superiority in the Gladiatorial sports, i.e., demonstration of naked brutal force. With the passage of time, the concept of physical activity and games has undergone a tremendous change to meet the scientific needs of human endeavour. The modern age has been influenced by the development of science and its application to make the human life more and more comfortable with the danger of deterioration in his physical abilities. Realising this fact, the man has taken up the challenge to use the scientific developments for his fitness and well-being also. The development of physical education curriculum is so inclusive that it includes many of the scientific disciplines (dealing with the human activities and performance) such as Anatomy, Physiology, Kinesiology and Psychology.

Since the man is a unit of 'body and mind', a comprehensive curriculum has been developed in physical education and sports to develop his mental as well as physical faculties comprising motor fitness, psychological
factors, physiological factors and body composition considerates.

Recently it is recognised that 'Physical Education' is, if not more, at least as important as education itself for the young and as the hope and future of every nation. To contribute to the total picture of what Physical Education is, Johnson (1957) stressed that modern 'Physical Education' is not simply an improvement over blending of old traditions of the discipline but is also a blending of various programmes like - physical education classes, intramural activities and athletic's at school, college and varsity level.

Johnson (1957) had put forth that physical education is to be an academic discipline and stressed the fact that, like any other academic discipline, it is a subject involving a body of knowledge which is learned by way of experience in a systematic programme of teaching. More and more professional people are identifying it as a profession dedicated to good living.

Barrow (1983) contented that physical education is eclectic because its origin is founded on information and data from various fields. Its basic facts and truths come from three main sources. First, there are basic sciences but principally biology, anatomy, physiology and kinesiology. Second, there are the humanities including
history, political science and philosophy. Third, there is the human social heritage including sociology, psychology and anthropology.

Larson (1965) has contended that physical education is no longer considered as mere participation in sports or recreational activities. In modern parlance, it has been elevated to the level of an "activity science".

Karpovich and Sinning (1971) have mentioned that "activity science" is a science which deals with a complex analysis of various facets of human activities affecting the human organism physically, mentally and socially.

**Concept of Motor Fitness**

Although the term motor fitness (while often used synonymously with physical fitness) was coined to include elements which involve more abilities than merely those of basic components of physical fitness yet it was not to encompass the various neuromuscular coordination skills which make up general motor ability. Motor fitness takes into account efficiency of basic movements and therefore would involve such elements as power, agility, speed and balance.

"Motor fitness is the final criterion through which all other elements of physical fitness or total fitness are seen and measured in man." (Brock 1941).
"Motor fitness is gauged by performance and this performance is based on a composite of many factors. The most commonly mentioned fitness factors are strength, endurance, power, speed, agility, balance, flexibility and stamina. Some of these factors evidently are more dominant than others and thus have a higher relationship with motor fitness." (Barrow and Rosemary, 1979).

"The objective of physical education includes the development of efficiency in the fundamental movements as well as the development of neuromuscular skills and organic efficiency. So, it well may be that it is more desirable to develop and measure motor fitness than basic physical fitness." (Johnson and Nelson, 1982).

Concept of Physical Education

Physical education is concerned with the "relationship between human movements and other areas of education, i.e. with relationship of the body's physical development to the mind and soul, as they are being developed". (Freeman, 1982). According to William (1964), "it is sum of man's physical activities selected as to the kind and conducted as to outcomes." When mind and body were thought as two separate entities, physical education was an education of physical self only but in the modern concept physical education is known as education through physical self involving concern
for and with emotional responses, personal relationship, group behaviour, mental learning and other intellectual, social, emotional and aesthetic outcomes. Jenny (1964) believes that, "the unique contribution that physical education has to make to general education is that the general body should be developed through physical activities." Barrow (1979) puts physical education into context of total educational experience. He stresses that physical education experience should relate to the total educational process and reach person's whole life. If physical education experiences make no contribution to the other educational experiences the proper function expected of a true physical education programme is not being fulfilled.

As we see through different definitions of physical education, physical education is conducted through physical means. There is some sort of physical activity involved; the physical activity usually, though not always vigorous, concerned with gross motor movements and the skills involved don't have to be finally developed. These processes through which the benefits are gained are physical and the benefit for the students includes improvement or change in such non-physical areas (falling within spectrum of educational development) relating with their intellectual, social and aesthetic growth. Indeed physical education should bring about improvement in mind and body.
Concept of Body and Mind Relationship

Van Dalen (1953) mentioned that ancient civilizations stressed the development of human qualities through the cultivation of body and mind. Socrates stated, "even in the process of thinking, in which the use of the body seems to be reduced to a minimum, it is a matter of common knowledge that grave mistakes can often be traced to bad health."

Plato spoke of healthy bodies for healthy minds. During the seventeenth century Descartes, although he treated the individual as having two parts, namely body and mind, yet he recognised the interaction between them. Rousseau considered the relationship between body and mind and stressed that they should be treated accordingly. He believed that in the education process, if we want to cultivate the mind we must cultivate the parts which the mind governs, namely, Physique.

In the nineteenth century, Wundt atomized the mind by reducing it to the elementary parts of sensations, feelings and images (Hall and Lindsay 1957). Since then there have been continuous attempts to investigate the relationship between body and mind. Sherrington (1940) shared and elaborated on treating human organism as a unified entity by stating: 'The muscle is the cradle of recognizable mind'. On the relationship between body and
mind he went on to say, "recognizable mind seems to have arisen in connection with the motor act. Where motor integration progressed and where motor behaviour progressively evolved, mind progressively evolved."

Accordingly body and mind are never independent. So there is a largely accepted maxim of "sound mind in a sound body". According to Williams, "Thinking may be affected by the condition of the digestive tract, the amount of haemoglobin in the blood and the secretions from the various glands."

There is an evidence that body and mind are closely related to each other. The mind and thinking can be affected by the condition of the parts of the body. Emotions perturb whole body while mind and thinking can be affected by digestive system. The whole body movements are changed according to the thinking of the person. Learning of different specific skills e.g. writing, reading and learning by heart etc., and acquisition of thousands of specific functions/movements leads to the development of a wholesome personality. In this situation, although body and mind are two different parts yet they work as a unified whole. By following the symbiotic mind and body relationship, the physical education helps to develop a wholesome personality through its programme.
In the complexity of relationship between body and mind, the domain of total personality is included. Sheldon (1942) has contended that there is a parallel between his somato-types and personality 'types' or there are two closely related temperaments namely body and personality. Cratty (1964) pointed out that personality theories include physical activity as a part contributing to one's personality. In addition, each theory also includes some aspect of intellect as an integral part of personality.

The behavioural sciences have long been of interest and importance to those working in the area of physical education and sports. The psychology of learning and one's performance in sports in particular have been areas of study in which the teacher and coach have continuously sought guidance as to the nature of the psychomotor abilities and skills with which they are concerned along with the ways in which most effective performance might be achieved. The recent intensification of academic study/research in physical education with respect to a wide range of physical education programme, particularly regarding the wide range of psychological interpretations of the process of learning skills has been both exciting and bewildering for the researchers and teachers alike.
Concept of Fitness in relation to Psychological Factors

During recent years, there has been a growing interest in finding possible relationship between an individual's psychological and physical functioning. Numerous research studies have been suggesting that the manipulations of physical fitness through a physical training programme may be used to change psychological functioning in predictable directions. Although these studies contain a number of interpretational problems, they have generally found that as physical fitness increases depression, anxiety and self-centredness decrease. Apart from that, self-satisfaction and social adjustment also increase (Bahrman 1967, Cooper 1968, Hellerstein, et al. 1967; McPherson, et al, 1967; Pipejoy, 1968; Stamford, et al, 1974). These researchers would generally agree with Ismail and Trachtman (1973) when they say "...physical activity can change the state of one's mind." Fisher and Cleveland (1958) have contended that a person's perceptions of his body exert a strong influence on his behaviour.

Layman (1972) has mentioned that a number of research studies have investigated the relation between physical fitness and emotional health. Of seventeen such studies, thirteen reported a negative relationship between fitness and symptoms of emotional disturbances.
However, Weber (1953) found no relationship between physical fitness and emotional health as indicated by the scores on MMPI (Minnesota Multiphasic Personality Inventory).

The postulated association between personality and performance would seem to be best supported by attempts to explain a common neuropsychological base for both. An increasingly strong line of reasoning attempts to explain personality in terms of neural arousal and there is interesting evidence to suggest that differences in arousal may affect performance in psychomotor tasks.

No psychologist has been more systematic than Eysenck in offering physiological and neurological explanations of the descriptive dimensions of personality. The assumption has long been held by physical educationists and others that an individual's physical (athletic) abilities are related to his personality structure. Ogilive and Tutko (1966) claimed to have identified personality dimensions which are characteristic of competitive athletic under-achievers. Physical educationists are also vitally interested today in the fundamental relationship between personality disposition and ability to learn motor skills required in sports, dance, recreational pursuits and body management in general so that programmes of work may be structured to cater for individual's personality differences.
The psychologists consider attitude as one of the personality characteristics and therefore the direction and strength of attitudes must bear some relationship with other personality traits, the intricate relationship of which need to be explored.

Attitude plays an important role in learning and teaching. Moreover, the acquisition of attitudes in itself constitutes a learning process similar to the attainment of the motor skills and academic knowledge. Attitudes are predispositions to actions. So, their proper development is important for the total development of the individual. They are acquired concurrently with activity and often exert tremendous influence. The attitude may manifest itself in a type of behaviour corresponding to the feeling, emotions and convictions evoked by it.

With this background it appears reasonable to find certain self-attitudes to be related not only to actual physical fitness but to cognitions about one's level of fitness as well. Heaps (1978) has concluded that although there is a definite psychological benefit following consistent exercise and physical changes, yet this benefit results not from the physical improvement, per se, but from the emotional or psychological perception of the physical and personal value of continued exertion.
Concept of Fitness - in relation to Physiological Factors:

Physiologists generally consider human body as a living thermodynamic machine, but there are certain remarkable differences between a human body and a machine. Unlike machines, which wear out more rapidly when they are used, living organisms generally develop an adaptive increase in functional capacity in response to increased use and undergo a decrease in functional capacity when they are not used.

Uppal (1982) mentioned that the development of a sportsman to enable him to achieve high level of performance is usually concentrated in four areas namely physical prowess, social adjustment, psychological development and physiological efficiency. For the physiological systems of the body to be fit, they must function well enough to sustain a particular activity that the individual is performing. Since different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic, neurological and temperature regulating functions, physiological fitness is specific to each particular activity. Physiological systems are highly adaptable to exercise. Each task has its major physiological components and fitness for the task requires effective functioning of the appropriate systems. In order to acquire the ability to run fast and cover ever-increasing distance certain changes in physiological
functions are necessary, so that exercise capacity of an individual can be enhanced.

Mathew and Fox (1976) are of the opinion that the efficiency of an individual in performing physical activities depends basically on cardiorespiratory changes and physical training causes development of cardiorespiratory efficiency. Through this training, the efficiency of circulatory and respiratory systems is improved and resting and exercise blood pressure values are lowered.

A fit or trained or conditioned athlete is characterized by the ability to withstand high levels of lactic acid and to use larger volumes of oxygen, maintain lower heart rate and pulse rate during any prolonged work. Thomas (1977) as a result of his research study has concluded that the high fitness group had a lower heart rate than the low fitness group. He also concluded that high fitness group attained their maximum oxygen uptake at a significantly lower mean heart rate than the medium fitness group.

However, deVries (1970) and Fox Edward (1985) were of the opinion that physically fit or trained athletes have more haemoglobin contents in the blood.

Concept of Fitness in relation to Body Composition considers

Performance in games and sports depends not only upon
psychological, sociological, physiological and physical training of the individual but also on physique and body composition which too affect it considerably. Though the training is equally important yet at higher level competitions, where training is given to all the individuals, suitable physique and body composition are of fundamental importance.

Sodhi (1980) has mentioned that in body composition studies the most important aim is not only an overall characterization of bodily components but also its quantitative evaluation as exact as possible according to actual methodological possibilities. Absolute amount of lean body weight serves together with body weight as basic somatic characteristic of body type and also as a reference of standard to which oxygen uptake and muscle strength etc. are related. On the other hand, the quantitative changes in depot fat can provide an important information on lipid metabolism and shifts in every substrates used as a fuel for muscle work.

It is further stated that body composition in certain sports indicated that those who were very lean but heavy because of well developed musculature were superior in performance in certain competitive sports activities such as football, weight lifting and shotput. On the other hand,
athletes who have substantial amounts of adipose tissue have increased energy demands owing to the inert weight of fat, thus rendering the work more difficult to perform in endurance activities where the body has to move longer with great weight. It may be for this reason that long distance runners are found to be less endomorphic than other runners and also than their counterparts at a lower level of competition.

However, the degree of excess fat may play an advantageous role, if not a vital one, in physical performance carried out under condition of cold stress. It is observed that the middle distance runners and channel swimmers were endowed with a substantial amount of subcutaneous adipose tissue and thus were often obese. Their ability to tolerate cold water for long periods was largely attributed to the insulation provided by the fat and to a reduced rate of heat loss.

India's position in the field of physical education is not so much recorded as compared to other countries like U.S.A., G.D.R., U.S.S.R., Japan and Britain. But now physical education in India has been recognised as an emerging profession. Many opportunities have been coming forth to join the profession of physical education.

Physical education is emerging as a discipline. The development of this discipline is helping to place the
field of physical education on more academic and scientific footing. More specialised degrees may appear, and very likely universities/institutions are expected to concentrate their graduate and undergraduate programs in specialised areas of physical education. To produce efficient specialists/professionals in physical education, students majoring in physical education will probably be required to work more in skill development activity areas in future.

The physical education profession is an activity oriented profession. It has theoretical and practical parts. To attain professional competence or to score high in activities of physical education, one has to excel to perform well. But physical performance is based on many factors such as physiology, psychology, anthropology, sociology etc. In physical performance, if two dominant factors are in favour and one essential factor is missing or vice-versa, one cannot excel well or give optimum performance even.

In the past, investigators have made appreciable attempts to find out in India the relationship of different aspects related to performance in different fields. But so far, no one has tried to investigate the relationship of motor fitness components of physical education majors to psycho-physiological ones and with the
body composition correlates. The rationale of this study is to fill the existing gap in research that is important from the point of view of growth and development/professional physical education programmes. Therefore, the present study was designed to achieve the purpose and to highlight the unknown factors to improve the general standard of physical education professional programmes.

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the relationship of selected motor-fitness components to selected psycho-physiological variables and body composition of physical education majors.

OBJECTIVES OF THE STUDY

1. To determine whether there is any relationship between selected motor-fitness components and selected psychological variables i.e. personality and attitude towards physical activity of physical education majors.

2. To find out the relationship between selected motor-fitness components and selected physiological variables i.e. blood pressure (systolic and diastolic) in lying and standing position, sitting pulse rate and haemoglobin of physical education majors.
3. To study the relationship of selected motor-fitness components and body composition of physical education majors.

DELIMITATIONS

1. The study was delimited to the colleges and departments of physical education of Panjab University, Chandigarh, Punjabi University, Patiala and Guru Nanak Dev University, Amritsar.

2. The study was restricted to the male students in the profession of physical education or those majoring in the field of physical education only.

3. The study was further delimited to the students of graduate and post graduate classes in the profession of physical education or majoring in the physical education i.e. B.P.Ed., D.P.Ed., M.A.(Phy.Edu.)/M.P.Ed., and M.Phil.(Physical Education).

4. The study was restricted to the selected motor fitness components:
   i) Power.
   ii) Agility.
   iii) Speed.
   iv) Cardiovascular Endurance.
5. The study was delimited to selected Psycho-Physiological variables:
   i) Personality.
   ii) Attitude towards Physical Activity.
   iii) Blood Pressure (systolic and diastolic).
       a) Lying.
       b) Standing.
   iv) Sitting pulse rate.
   v) Haemoglobin.

6. The study was further delimited to body composition considerates:
   i) Body Weight.
   ii) Lean Body weight.
   iii) Percentage of Body Fat.

7. The study was restricted to some skinfold measurements:
   i) Abdominal skinfold.
   ii) Thigh skinfold.
   iii) Scapula skinfold.

HYPOTHESES

It was hypothesised that:

1. There would be no significant relationship between selected motor fitness components and selected psychological variables of physical education majors.
2. There would be no significant relationship between selected motor fitness components and selected physiological variables of physical education majors.

3. No significant relationship would exist between motor fitness components and body composition of physical education majors.

DEFINITION AND EXPLANATION OF TERMS USED

Physical Education Majors:

Students, who have joined physical education as a professional career or intend specialising in the physical education profession (Oxford Dictionary).

Motor Fitness:

"Motor fitness is one's ability to perform efficiently basic motor skills involving such elements as power, agility, speed and balance (Johnson & Nelson, 1982).

Power

"Power may be defined as the ability to release maximum force in fastest possible times." (Johnson and Nelson, 1982).

Agility

"Agility is the ability of the body or parts of the body to change directions rapidly and accurately." (Barrow & Rosemary, 1979).
**Speed**

"Speed is the capacity of moving a limb or part of the body lever system or the whole body with the greatest possible velocity" (Dick, 1980).

**Cardio-vascular endurance**

"Cardio-vascular endurance is characterized by moderate contractions of large muscle groups for relatively long periods of time, during which maximal adjustments of the circulo-respiratory system to the activity are necessary, as the distance running and swimming." (Clarke & Clarke, 1987).

**Psycho—Physiological Variables**

The word 'Psycho' is a learned borrowing from Greek, used to represent 'Psyche' (psychology) and psychological in compound words (Random House Dictionary, 1986); whereas in this study 'Psycho' is used as an adjective before the term physiological to represent a term known as 'Psycho-Physiological variables. So, two separate variables i.e. (a) selected psychological variables and (b) selected physiological variables were undertaken for the investigation.

(a) **Selected Psychological Variables**

**Personality**

Personality is defined as the "unique organisation
of relatively enduring psychological characteristics possessed by an individual, as revealed by his interaction with his environment" (McKeachie, Wilbert & Doyle, 1966).

**Attitude**

"Attitude is defined as a latent non-observable complex, with relatively stable behavioural disposition reflecting both direction and intensity of feeling towards particular object whether it be concrete or abstract, then analysis of state of readiness for physical activity within the individual can be attempted". (Kenyon, 1968).

(b) **Selected Physiological Variables:**

**Blood pressure**

Blood pressure has been defined as the "force or pressure which the blood exerts on the walls of the blood vessels in which it is obtained. When the left ventricle contracts and pushes the blood into the aorta, the pressure produced is known as the systolic blood pressure. When complete cardiac diastole occurs, and the heart is the resting with
no ejection of blood, the pressure within the blood vessels is termed as the diastolic blood pressure." (Ross & Wilson, 1973).

**Sitting Pulse Rate**

Sitting pulse rate has been defined as "the number of pulse waves per minute feel at the radial artery in sitting position after a resting interval of several minutes." (Johnson & Nelson, 1982).

**Haemoglobin**

"Haemoglobin is a complex molecule found in red blood cells, which contains iron and protein and to capable of combining with oxygen." (Mathew & Fox, 1976).

**Body Composition**

"In very simple terms, body weight is made up of fat weight or fat free weight. Percentage body fat is simply the proportion of total weight that is fat weight. It's possible for two individuals of the same sex, height, and body weight to differ substantially in percentage of body fat, which is why we use percentage of body fat on the standard for evaluating body composition." (Baumgartner & Jackson, 1984).
SIGNIFICANCE OF THE STUDY

1. The study would help the teachers and students of the professional institutions of physical education to understand the importance of the psycho-physiological variables and body composition and its relationship with motor fitness.

2. The findings might help in designing the scientific programmes for physical education majors.

3. The study might prove useful for the admission of suitable students into the physical education professional courses.

4. The findings may add new knowledge to the profession of physical education as a whole and research in physical education in particular.

5. The results of the study may open new fields of research for the professional students of physical education.