Chapter I

INTRODUCTION

Children are said to be the citizens of tomorrow and builders of the nation. Their smiles inspire hopes and they are the pioneers of tomorrow. But the state of children in this country is miserably languishing in innocence and silence. The findings of the national and international organisations reveal the plight of our children and call for an all out effort to save these withering blossoms from further degeneration and disruption.¹

Fundamental to success in education or any other facet of living is good health and it cannot be achieved in youth unless growth and development takes place in an acceptable manner. A sound body is necessary for the child to achieve his full potential unless he has the capacity to develop his physique and physical fitness to attain the objectives cited above.²

Who has not heard the adage "Health is Wealth" yet, regrettably so large majority of us do not realise the meaning of good health, or

significance of keeping good health. The question is as to what goes in making good health. Each person has to acquire a basic physical fitness without which his daily work would seem to be a burden and he would not be able to discharge his duties and responsibilities properly as a citizen. Broadly speaking a person is said to possess good health when he has the required basic physical fitness, mental alertness and good moral and spiritual blend as combination of all these will make life happy and worth living.\(^3\)

Now in the modern age of science and technology in every field of education, objectives are followed in accordance with the application of scientific research. In the field of games and sports all the developed countries like USA, USSR, GDR, Japan, China etc. have progressed rapidly due to the scientific research and their application in the field. These countries are providing ample facilities and systematic programme for physical education, especially for school children and university youths, realizing that the physical fitness is fundamental for happy and purposeful living besides the contribution to economic growth and nation.

Physical fitness is the ability to carry out daily tasks with vigour and alertness without undue fatigue and to have ample energy to enjoy

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\(^3\) Thiagarajan, *Your Health*: 419.
leisure time pursuits and to meet unforeseen emergencies. This implies fitness alone has necessary qualities for doing any work. These qualities will vary from time to time in the same person. The continuously changing life process creates different needs and inspires different individual, as they grow older. There is an optimum level of fitness for different age groups. The needs and requirements of an ever-changing environment interacting with the on going life process of the individual make changing demands on the individual. For better understanding of physical fitness the components of physical fitness must be known. The components of physical fitness as listed by Larson and Yacom are: Resistance for disease, muscular strength, muscular power, muscular endurance, cardio-vascular endurance, flexibility, speed, agility-coordination, balance and accuracy.⁴

Both heredity and environment provide for greater variations in growth. These variations complicate the job of the education, especially of the physical educator. An important step in establishing the educational process for children is to understand the nature of child as revealed by his biological, psychological, emotional and social needs. Teachers, coaches and researchers, who work with children, must

understand the needs and characteristic of children that motivate and structure their behaviour at the various age levels.\footnote{Barrow, \textit{Man and Movement: Principles of Physical Education}, p.141.}

The knowledge of growth and development characteristics of the children is very essential for the curriculum construction in the elementary school. A thorough knowledge of needs and capacities of the children of both sexes and age level is an aid to the physical education activities.\footnote{Carl E. Willgoose, \textit{The Curriculum in Physical Education} 3rd ed. (Englewood Cliffs, N.J.: Prentice Hall Inc., 1979), p.123.}

Although the term, growth and development follow a pattern in general, these are wide variations and differences with the pattern. While growth is generally viewed as increase in height, weight and size, development has to do more with functioning aspect of the body mass. Therefore, growth represents an increase in mass while development indicates an ongoing action of the mass with respect to its functional abilities. They may go on simultaneously, but may also proceed independently of each other.

The growth refers to the increase caused by the biological process in which the child becomes bigger in size in volume and heavier in
weight. Starting its life from almost an invisible dot, the human organs grow to be more than 100 pounds in weight - growth indicates the enlargement of cell fibers and muscles, elongation of skeleton and increase in general volume of body parts and organic system. Growth is anatomical in nature and to a great extent it is quantitative in the sense that it can be measured. Marked structural changes are noticed as the organism travels further in time. Day after day and year after year, as the child looks different in appearance, it concludes that the child is growing. Similarly the heart also, grows bigger, undergoes qualitative transformation and it becomes capable of pumping out more blood thus withstands the vigorous exercise.  

Knowledge of how children grow i.e. the sequential changes and variability in the rate of growth from time to time and from child to child should give every adult, who lives or works with children, a basis of understanding the individual child. Thus, the teacher can set the stage for the child, fits his activities according to his maturity and ratio of physical growth/development provide him with necessary programme for proper growth.

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There are many factors that influence growth. Basically, hereditary furnishes the reference points along which growth and development takes place. Hereditary influences the growth and development of an individual; however there are wide limits with in which environmental factor also becomes influential. Environmental factor, which can influence the growth and development are nutrition, climate, outdoor living, fresh air, sunshine, exercise and rest.

The question of pupil’s growth and development characteristics is especially important in the curriculum construction process. Activities need to be selected ought to be in keeping with physical, intellectual, social and emotional behaviour of the children at specific levels. Knowledge of children needs and general capacities at any age level is an aid to the physical education teacher in the organisation of the programme of studies.

The sequence of physical growth and the sequence in gross motor performances are concurrent developmental phenomena. It is, therefore believed that knowledge of the sequences and their relationship would assist the teacher of physical education to provide activities conducive to the pupil’s attainment of optimum growth and development of the fundamental purpose of any educational programme for the children to
help them to learn. The learner is the key to the total educational process. It is the learner for whom the programmes are planned. Before any institution begins, a thorough study of the nature and needs of the learners should be made. Knowledge of the nature and needs of the learners includes information about their physical, psycho-motor, social and intellectual characteristics. It is on the basis of this information about the learners that the social objectives are formulated and ultimately sound programmes are developed.\(^8\)

With the study of literature of growth and development and also by the known scientific knowledge it has been proved that the rapid growth will take place in the age of 12 to 20 years. The physical education teacher must understand the children and their level of physical development and maturity.\(^9\)

Traditionally, the psychological area in physical education and sports has been concerned with motor performance; motor learning sports and skill organisation. This emphasis has been the result of the training


and interest of the psychologist mainly trained in experimental psychology that has switched over to and worked in physical education.\textsuperscript{10}

Since physical education and sports activities are mainly based upon motor skill, the psycho-motor components are of great concern to physical educator and coaches. Most of the sports task requires a high degree of development of psycho-motor components and kinesthetic perception, as they are instrumental in producing the best performance.\textsuperscript{11}

The psycho-motor domain is concerned with movement and other closely related factors that influence it. Through sports, exercise and dance as well as with work and locomotor skills, students overcome both their own forces and the forces universally found in nature such as the physical laws and principles governing forces, gravity, friction and motion. Movement is the key to life process while it is associated directly with muscular contraction and involve in its myriad functions (consisting of very great but indefinite number, innumerable); it is also associated with neural (related to or affecting a nerve or the nervous system) mechanism-hence psychomotor domain or sometimes neuromotor or


neuromuscular domain. There are levels of utilization of the body's forces and there are many restrictions on movement in sports exercise and work skill.\textsuperscript{12}

Perception of space field is primarily depending upon visual and auditory information integrated with temporal judgement. Perception of stable two dimensional space may depend on qualities of closer figure ground, proximity and similarity wherever the principle of known linear perspective and texture interposition are applied. The study of movement in two-dimensional and three-dimensional space has suffered as the event perception of this nature are linked with the judgement of time. The development of apparatus with which to evaluate dynamic visual acuity and to evaluate the manner in which ball are tracked and intercepted, hold promises of more definite work relating to athlete ability and success to visual perception attributes. At the present time the finding from studies comprising visual and perception abilities of athlete and non-athletes are mixed.\textsuperscript{13}

The ability to time movement is an important ingredient in the performance of physical activity. It is notably lacking in early childhood. As a youngster grows old, age makes rapid improvements in each of these skills and a hall of others requiring the individual attention and continual practice for years as these skills are affected by the degree of excellence required by the contemporary athletes. The common factors of most of these tasks are to anticipate the arrival of some objects and then to plan ahead so that it may be anticipated at the correct movement. This is generally referred to as coincidence anticipation.\textsuperscript{14}

Psycho-motor factor is probably the other commonly used factor employed for grading purpose in physical education. The skills in the activity, the fitness and game performance are measured under this factor. In the skill area the grade for each sport might be determined with several measures: a skill test, team work performance if the sports in team sports, tournament standing in individual sports and subjective analysis of the students ability to play the sports. When skill test is not feasible, the student's ability in various skills of the sports can be measured by rating devices.\textsuperscript{15}


\textsuperscript{15} Charles A. Bucher, Foundation of Physical Education (London: The C.V. Mosby Company, 1976), pp. 82-64.
In the process of growth and development the physiological functioning of the child is consolidated and his motor abilities reach to new levels. Although growth and development follow a general pattern, yet there are wide variation and differences within this pattern. Growth is generally viewed as increase in height, weight and size while development is viewed as a whole.\textsuperscript{16}

Since many studies have been done on school children in one or the other context but as everybody knows that generally growth (between 12 to 20 years) makes remarkable impact on the body in terms of physiological capacities, psycho-motor abilities and physical components, supported by Harold M. Barrow. Researcher is deeply interested in studying the effect of growth on the students from sixth to tenth standard school children of Greater Gwalior because of this age reason and also due to availability of scientific equipment to measure psycho-motor abilities and physical components in the laboratory, nobody has done research on the children of Gwalior by taking these parameters in this context.

Statement of the Problem

To see the effect on psycho-motor abilities, physiological variables and physical components as a function of growth from sixth to tenth standard school children of the Greater Gwalior.

Delimitations

1. The study was delimited to the following variables:

   Psychomotor Abilities:
   
i. Reaction ability.

   ii. Depth perception.

   iii. Anticipation ability.

   Physiological Variables:

   iv. Resting heart rate.

   v. Vital capacity.

   vi. Breath holding capacity (Positive & Negative).

   a) Positive breath holding capacity.

   b) Negative breath holding capacity.
Physical Components:

vii. Strength - leg strength.

viii. 600 yard run.

ix. Flexibility - trunk, knee.

x. Agility - shuttle run 4 X 10M.

xi. Speed – 50M.

2. The study was further delimited to boys from VIth and Xth standard school children of the Greater Gwalior.

3. The study was further delimited to the Greater Gwalior school children.

Limitations

1. Regular routine, food habits, and social background of the children were the limitation of the study.

2. No motivational technique was used while taking performance in various tests.

3. Climatic condition was another limitation.
Hypothesis

It was hypothesised that there wasn't any effect on the psycho-motor abilities, physiological variables and physical components as a function of growth from VIth to Xth standard school children of the Greater Gwalior.

Definition and Explanation of the Terms

Psycho-motor Variables

Reaction Time

The ability underlies the task for which there was one stimulus and one response and subject must react as quickly as possible after a stimulus in simple reaction time situation.

Exercise: sprints, starting in swimming.\textsuperscript{17}

Depth Perception

Depth perception is the ability to distinguish the distance of object or to make judgement about relative distance. This capacity also is called as distance perception; add the old dimension to height and width.\textsuperscript{18}

Anticipation

Performer detects the upcoming events with various sensory receptors. However, the performer must also estimate as to how long his/her own movement will take and allow for this interval in initiating the action, (e.g. Balling in baseball).

Physiological Variables

Resting Heart Rate

The resting heart rate or pulse rate or heart frequency is defined as frequency of heart beats in one minute of the resting condition.\(^\text{19}\)

Breath Holding Capacity

Breath holding capacity is defined as the duration through which one can hold the breath without inhaling or exhaling. Positive breath holding is defined as the duration of holding breath after a full inhalation.

Negative breath holding is defined as the duration of holding breath after full exhalation.\(^\text{20}\)

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Vital Capacity

Vital capacity may be defined as the longest volume of air that exhaled after deepest possible inhalation.\textsuperscript{21}

Physical Components

Strength

Strength has been defined: strength is the force that a muscle or group of muscles can display against a resistance in one maximum effort.\textsuperscript{22}

Endurance

Muscular endurance refers to the amount of work that can be done through sustained effort in a given task either static or dynamic.\textsuperscript{23}

Flexibility

Flexibility is the ability of an individual to move the body and its parts through a wide range of motion as possible without undue strain to the articulations and muscle attachment.\textsuperscript{24}

\textsuperscript{21} Ibid.
Speed

The rate at which a person can propel his body or his parts through space.\textsuperscript{25}

Agility

The ability of the body or parts of the body to change directions rapidly and accurately.\textsuperscript{26}

\textbf{Significance of the Study}

1. The results of the study will help the teacher in understanding the growth pattern of different standard children i.e. from sixth to tenth standard in relation to selected variables.

2. The results of the study will help in understanding the development needs of different standard children, specifically for physical education teacher, in order to prescribe the needed activities.

3. The results of the study may help the parents to know the growing patterns and in turn potentiality of their children to carry out particular task in particular group.

\textsuperscript{25} Ibid.
\textsuperscript{26} Barrow and McGee, \textit{A Practical Approach to Measurements in Physical Education}, p.258.
4. The results of this study may help in planning the physical education programs systematically & successfully.

5. The results of this study may help in systematic management of training program of School children.

6. The study may be useful to health scientist, physical educationist, coaches, trainers and those who want to use it as per their need and necessity in their respective areas.