CHAPTER I

INTRODUCTION

"I have the strength to face all conditions by the
power that Christ gives me" - Philippians 4:13

Daily quality physical education in the nation’s schools is an important part of a student’s comprehensive, well-rounded education programme and a means of positively affecting life-long health and well-being. The optimal physical education programme will foster a lifetime commitment to physical activity as part of a healthy lifestyle. Ultimately, improved coordinated school health programmes, of which physical education is a central component, will augment other prevention efforts and help to reverse the growing epidemic of childhood obesity which threatens to undo decades of progress in the fight against cardiovascular and other diseases. Effective efforts made now will help children avoid a lifetime of chronic disease and disability.

Regular physical activity is associated with a healthy, longer life, a lower risk of heart disease, high blood pressure, diabetes, obesity, and some cancers (Eyre, et al., 2004). Current recommendations are for children to engage in at least 60 minutes of physical activity each day. Children spend over half their day in school, so it is reasonable to require that they should get at least 30 minutes of that time in school. Physical education should be an
important part of that requirement and does more than some minutes of moderate-vigorous activity do. It also teaches students how to integrate exercise into their life in order to establish a lifetime of healthy living. Unfortunately, only 3.8% of elementary, 7.9% of middle, and 2.1% of high schools provide daily physical education or its equivalent for the entire school year. Twenty two percent of schools do not require students to take any physical education at all (Centers for Disease Control (CDC), 2006). Since childhood obesity rates continue to rise across the country, there is public support for more physical education in schools. The vast majority of parents of children under 18 (95%) think that Physical Education should be a part of school curriculum for all students in grades K-12 (Public Attitudes toward Physical Education, 2003).

In a systematic review of physical education programmes that increased the amount of time that students were physically active, students' aerobic and physical fitness increased. Additionally, the benefits of modifying the school physical education curricula were experienced across diverse racial, ethnic, and socio-economic groups, among boys and girls, elementary and high school students, and in urban and rural settings (Kahn, et al., 2002). A six month exercise programme among obese children and adolescents reduced Body Mass Index, diabetes risk factors and low-degree inflammation and demonstrated that regular exercise can restore blood vessel function and improve cardiovascular risk factors (Meyer, et al., 2006).
Evidence from the Early Childhood Longitudinal Study showed that physical education programmes have an impact in combating childhood obesity in young overweight girls. Just an extra hour of exercise a week lessened obesity in this group (Datar and Sturm, 2004).

A growing body of evidence demonstrates the benefits of physical education beyond fitness. Several large-scale studies found improvements in students’ academic performance and cognitive ability with increased time spent in physical education (Coe, et al., 2006). Recent studies have found a strong correlation between aerobic fitness and academic performance as measured by grades in core subjects and standardized test scores (Castelli, et al., 2007). Additionally, children, who spent time in physical education in place of a classroom activity, performed no worse academically than students who did not enroll in physical education (Sallis, 1999). Physical activity also has a positive impact on tobacco use, insomnia, depression, and anxiety (Suitor and Kraak, 2007). Normal weight children have lower rates of school absenteeism than obese children (Geier, et al., 2007).

The quality of the physical education programme, not just the time spent on the class, is the foremost concern. Physical education policy should prioritize quality while, simultaneously and/or subsequently, trying to increase the amount of time physical education is offered in schools.
Health

Health is a reflection of one's overall physical, mental, and social well-being. It is much more than simply an absence of disease. Health, as we all know, is a characteristic that is not stable in time and can vary along a continuum from near death (ill health) to optimal physiologic functioning (high level wellness).

World Health Organization (WHO) defines health as “a state of complete physical, mental, spiritual, and social well-being and not merely an absence of disease or infirmity”.

It is the state of relatively equilibrium of body form and function which result from its successful dynamic adjustment to forces tending to disturb it. It is also defined as the state in which the mental and physical activities of the body are adjusted satisfactorily to the environment.

J.P. William defines health as “it is a quality of life that enables the individual to live the most and to serve the best”

Webster Dictionary defines health as “the state of being hale and sound in body, mind or soul especially from physical disease or pain”.

Components of Good Health

Perfect health has four components: physical, mental, social, and spiritual.
Physical Health: Physical health means that an individual should be physically fit and should be free from sickness and diseases.

Mental Health: Healthy mind resides in a healthy body. A person who has firm determination and self control is not dominated by fear, anger, love, jealous, stress, and worries.

Social Health: Man is a social animal. He cannot live individually. He will have to depend on others to fulfill his basic necessities.

Spiritual Health: Spiritual health is concerned with spirit or soul and is that health which evokes good spirit and keeps away from bad activities.

Need for Health Education

a) to know the scientific health knowledge so that one can make intelligent health decisions.

b) to develop desirable health attitude in order that the individual will have an interest in applying health knowledge to his own daily schedule of living.

c) to convey that health is a three dimensional entity, embodying social, mental, and physical aspects.

d) to contribute physical, social, and emotional development.

e) to encourage to be a consumer and producer with respect to health goods and services.

f) to encourage the correction of remedial defects.
g) to help everyone to live healthfully at home, school, and colleges.

h) to reduce the incidence of communicable disease in school, college, and community.

i) to utilize the many health services available.

j) to further home-school cooperation in health matters

The school health activities may deal with a) health protection b) correction of defects and health conservation of defectives c) health promotion.

The elements of the school health programme are commonly grouped into four areas as

1. Healthful school living
2. School health services
3. Health education
4. School, home, and community relations

1. Healthful School Living

Outdoor Physical Education Facilities: The play fields and play grounds should have good turf and be clear of rocks, holes, and uneven surface. A dirty and dusty surface can aggravate conditions such as chronic bronchitis and allergies. Safety precautions should be provided.

Indoor Physical Education Facilities: Adequate space should be provided for all activities and mate should be used as a protective measure.
Proper flooring should be used. Space should be provided for adapted physical education programme.

2. School Health Services

Physical examinations, dental examinations, and psychological examinations are for the appraisal of health of pupils, parents, and others are counselled by school personnel with regard to health problems. Provision of emergency services is to be done in case of injury or sudden illness. This involves establishment of basic policies, procedures, and the continuous appraisal of their effectiveness.

3. Health Education

Health education in schools should provide a systematic programme for the development of desirable habits, attitudes, concepts, and knowledge in the field of individual and community health. As health education is a part of general education, it rests mainly in the hands of the classroom teachers. So teachers can modify the students' habits. Teaching procedure provides a variety of learning experiences from classroom discussion, problem solving activities, direct first hand experiences at school, demonstrations, and individual guidance.

4. School, Home, and Community Relationships

a) the visit of the teacher to the home

b) home visit by the school nurse
c) visit of parents to the school

d) communication to the home

e) parent's meeting

f) the parent-teacher association, school health council, or health committee

g) relating school health education to education outside of schools

h) school participation in community health planning

Creating Health Awareness among the People

Creating awareness about any meaningful aspect of life is a big challenge, especially in the country like ours where a large part of population are illiterate and without any access to mass media. And the crux of the problem is that this population is in more need of awareness.

For the literate people, mass media is the best way to generate awareness. Television, internet, and newspapers are very effective and are doing a great service in spreading message to masses. There is a need to use these effective mediums wisely and for the good of the people.

For the awareness about health, there is a great need to inculcate good habit from the childhood. For this, there is a great need to include health education in the education system of the country. A holistic syllabus can be framed out to give suitable information about health, healthy habits, Indian system of medicines, uses of indigenous locally herbs, etc.
To make the education system reach the population, we need to use the traditional medium like street play, folk songs, and folk dances and create a kind of network of people with the people’s participation for carrying out the awareness activities.

**Physical Activity and Health**

Morris, et al., (1953) in London, conducted the seminal studies in 1950s on bus-conductors and postal workers. They were the first to show a link between habitual physical activity and coronary heart diseases. Research on health and the functional effects of physical activity has since then progressed. Our physical movements directly influence our ability to learn, think, and remember. It has been shown that certain physical activities that have a strong cognitive component such as outdoor games or dance enhance social, behavioural, and academic abilities. Each person’s capacity to remember old information is improved by biological changes in the brain. And those changes are brought on by physical activity.

**Physical Fitness**

Physical fitness is defined as the ability to carry out the daily tasks with vigour and alertness, without undue fatigue, and with ample energy to engage in leisure pursuits and to meet emergency situations.

Physical fitness is a physiological state of well-being that provides the foundation for the tasks of daily living, a degree of protection against
chronic disease and a basis for participation in sport. In essence, physical fitness describes a set of attributes relating to how well one performs physical activity.

Physical fitness is one of the richest possessions and it cannot be purchased but it has to be earned through a daily routine physical exercise. It is self-evident that the fit citizens are the best assets of a nation and weak ones, its liabilities. It is, therefore, the responsibility of every country to promote physical fitness of its citizens because physical fitness is the basic requirement of most of the tasks to be undertaken by an individual in daily life.

Ruth Lindsay says “Physical fitness implies the ability to function at one’s best level of efficiency in all his daily living”. Charles A. Bucher says “Physical fitness is the ability of an individual to live and lead a balanced life. It involves physical, mental, emotional, and spiritual factors and the capacity for their wholesome knowledge”.
Classifications of Physical Fitness

Health Related                          Skill Related
Cardio respiratory endurance          Power
Muscular strength/Endurance            Agility
Flexibility                           Speed
Body composition                       Co-ordination
                                         Balance
                                         Reaction time

Health Related Physical Fitness

A scientific body of knowledge links the positive effects of regular vigorous exercise with the prevention of degenerative disease. This is called Health Related Physical Fitness

Skill Related Physical Fitness

Physical Fitness that enhances performance in sports and other forms of physical activity and the qualities which are associated with physical performance or skill is called Skill Related Physical Fitness. Health related fitness may also benefit performance.
Awareness of Physical Activity

Ronda, et al., (2001) investigated that regular activity, fitness, and exercise are critical for the health and well being of people of all ages. Research shows that everyone (young or old) can benefit from regular exercise which is either vigorous or moderate. Awareness of a physical activity is complex health related behaviour and it consists of a large number of activities that are spread over everyday activities such as walking, cycling, swimming, running, etc. The determination of one’s own level of physical activity is difficult and therefore the importance of awareness of a physical activity is highlighted. Students who experience the curriculum will be given opportunities to learn and practice the ways of maintaining active, healthy lifestyles and improving their healthy status. Scientific content to be studied includes anatomy, physiology, health, physical fitness, and acquisition of the relevant skills. Students are also encouraged to be sensitive about gender issues and issues affecting the differently abled. This will impact on how movement and patterns of participation in physical activity are valued by students.

Scully, et al., (1998) explained that physical activity is necessary to maintain good emotional and physical health. It is necessary also to prevent disease. Physical inactivity has become a major public health problem, contributing to chronic and non-communicable disease epidemic. Obesity is closely associated with diabetes and certain types of cancer,
anxiety, stress, high blood pressure, and elevated cholesterol which contribute to heart disease and stroke.

**Physical Exercise, HEPA and Physical Fitness**

Bouchard and Shepard (1994) researched that physical exercise is defined as “a subset of physical activity that is planned, structured, systematic, and purposeful physical activity”, while Health Enhancing Physical Activity (HEPA) defines as “any form of physical activity that benefits health and functional capacity without any undue harm or risk”.

Increased physical activity has been associated with an increased life expectancy and decreased risk of cardiovascular disease. Physical activity produces overall physical, psychological, and social benefits. Inactive children are likely to become inactive adults. And physical activity helps with controlling weight, reducing blood pressure, raising High Density Lipoprotein (HDL) ("good") cholesterol, reducing the risk of diabetes and some kinds of cancer, improving psychological well-being, and including gaining more self-confidence and higher self-esteem.

**Benefits of Regular Physical Activity**

Regular physical activity has a lot of beneficial effects. Besides making us feel better, it gives satisfaction and better self-esteem and helps us stay fit and vital. It is also used as a preventive and curative tool since it lowers blood pressure, increases insulin sensitivity and lowers blood glucose
level, lowers serum LDL cholesterol level, increases serum HDL cholesterol level, reduces percentage of body fat, reduces stress, improves cardiovascular functional status and performance, prevents osteoporosis, prevents and treats diseases of the locomotor system, and increases life expectancy compared to sedentary people.

DC Author (CSPI, 2005) reported that the good news about fitness is that it is never too late. No matter what one's age is. A person can begin gradually improving health and well being by developing a fitness plan and also does not have to become a star athlete with the body of an Olympic contender to achieve fitness goals. Fitness is regular for all people who want to prevent disease and maintain a healthy weight. The minimum goal for all Americans is to accumulate 30 minutes of moderate intensity exercise over the course of the day on the most days of the week. Regular moderate to vigorous physical activity improves memory and enhances greater connections between neurons. Exercise combats chronic diseases. Regular physical activity can help to prevent or manage high blood pressure. Cholesterol too will benefit. Regular physical activity boosts high-density lipoprotein (HDL) or good cholesterol while decreasing triglycerides.

Exercise helps to manage one's weight. A person who engages in physical activity burns calories. The more intense the activity, the more calories one burns and the easier it is to keep weight under control. One does not even need to set aside major chunks of time for working out. One has to
take the stairs instead of the elevator. One has to walk and do jumping jacks during lunch break and commercials.

Behrman and Deolalikar (1988) & Strauss and Duncan (1998) reported that economists are interested in health, because it is an important element of well-being, it is the component of human capital, and it is important for growth and development. In poor countries physical jobs tend to be more abundant and health may be more important than education in determining labour productivity. The literature on health and economic development has been surveyed.

Example of Exercises - Various Activities Ranging from Very Light to Vigorous.

A. Very Light Activities - standing activities, chair exercise, stretching, and rubber tubing exercise.

B. Light Activities - walking 30 min, house cleaning, light yard work, stretching, and golf.

C. Moderate Activities - walking 15 min/mile, hoeing a garden, climbing stairs, and dancing.

D. Vigorous Activities - walking briskly (>3.5-4.0 mph), recreational sports, and jogging.
Importance of Physical Exercise and Physical Fitness

Long and Healthy Life - Regular exercise reduces the risk of developing heart disease, high blood pressure, high cholesterol, diabetes, and several types of cancer.

Weight Control - If a person tries to lose weight simply by dieting, will lose primarily water (which is easy to gain back), some muscle, and a little bit of fat. Regular exercise is a part of weight loss program.

Strength and Stamina - In one study, middle-aged women who lifted weights for a year became 27% more active in daily life than before they started lifting weights.

Strong Bones - Weight bearing exercises like walking and running also help keep bones strong.

Sharp Mind - Multiple studies have confirmed that regular exercise is one of the best things for mind action. It improves brain function.

Prevention of Low Back Pain - Strengthening abdominal and lower back muscles can help prevent low back pain. It can also reduce discomfort from this back pain. Also, it might be able to avoid back surgery by strengthening abdominal and lower back muscles.
Academic Performance

Symons, et al., (1997) reviewed that vigorous physical activity has positive effects on academic achievement including increased concentration, improved mathematics, reading, writing test scores, and reduced disruptive behaviour.

Crist (1994) demonstrated a significant difference in academic performance among low-achieving children who participated in aerobic activity during the school day. It may be that the beneficial effects of high child physical activity levels on school achievement only exists in certain populations of students.

Haskeel William (1996) reported that as we have approached the twenty first century, we can expect to continue to experience that rapid and profound changes of our society have taken place during the last quarter of the century while we are in more complex society. We will continue to experience two of the major changes like the new impact of a new technology on our work and leisure time and the general aging of the population during the first half of the next century. This will increase the need to effectively promote a physically active life style.

Brownell and Horgen (2004) reported that exercise can decrease stress and anxiety and increases self-esteem among adolescents. Active children are less likely to smoke or to use drugs and are more likely to behave well and stay in school. Research with adolescents shows that low
physical activity is associated with lower fruit and vegetable consumption, cigarette smoking, alcohol and marijuana use, watching TV more time, less use of seat belts in cars, and perception of low academic performance.

Reston (2001) reviews that a reduction of 240 minutes per week in class time for academics to enable increased physical education led to consistently higher mathematics scores. There are 1,440 minutes every day. 30 minutes of duration should be scheduled for physical activity. Regular exercise is a critical part of staying healthy. People, who are active, live longer and feel better.

Ratey and Hagerman (2008) investigated that exercise that involves learning complex movements can affect our brains in other ways. Gymnastics, dance, and movements from sport (e.g., ballroom dance, dribbling with the non-dominant hand in basketball) involve a variety of coordinated movements, and practicing them causes more connections to grow between neurons. Exercise, that forces us to improve balance and coordination such as those in gymnastics, strengthens neural networks in the cerebellum which is responsible for balance, physical coordination, and for coordinating our social interactions. This type of motor activity also affects the basal ganglia and corpus callosum, improving memory and increasing the ability to master new information. All brain functions are descendants of movement. To improve the function of brain, we have to move our bodies, take action, and get going.
Functions of Brain after 20 Minute Physical Exercise - A study from Illinois University

FIGURE 1.1. BETTER PERFORMANCE OF FIT CHILDREN

Mitchell & Melissa (2004) reviewed that researchers at the University of Illinois examined the relationship between fitness and academic achievement. "We have found a strong relationship between academic achievement and fitness scores", say Darla, et al., Professors of kinesiology and an expertise in effective physical education practices. "Those who scored well in academics also did well in physical fitness", says Co-researcher, Charles Hilman, a kinesiology professor, University of Illinois. He also says, "...fit children made fewer errors than sedentary ones". Parents and educators should ensure that children get enough exercise for their health and learning potential.
Physical Activity and Student Learning

Chomitz, et al, (2009) reviewed that physical activity and physical fitness have been shown to have positive effects on cognition and concentration. Physical activity is consistently related to higher levels of self esteem and lower levels of anxiety and stress, each of which has been associated with enhanced academic performance. Attentiveness is likely to be greater in an active student rather than a sedentary student. This may facilitate favourable interaction between classroom learning and student cognition. Scoring within the healthy fitness zone on all five components of the health related physical fitness test battery is positively correlated with passing scores in Mathematics and English language (especially in maths). Regular exercise can alleviate stress, anxiety, and depression and boost self esteem.

Brown and Blanton (2002) & Patel and Luckstead (2000) explained that the structure of physical activity in schools provides social benefits that could result in academic outcomes. Children who learn to cooperate, share, and abide by rules of group physical activities and those who learn to discover and test their physical abilities even in individual activities are likely to feel more connected to their school and community and want to challenge themselves.
Importance of Physical Activity for Children

Caine and Caine (1991) explained that enriched mental environments produce brain growth throughout life. When people are physically and mentally relaxed, they learn better. Although improved aerobic capacity by itself is not going to improve reading achievement, physical and other activities that promote good health seem to promote intellectual capacity. It also reduces the risk of having a stroke. In one 8 year study of more than 20,000 men who were lean but unfit, had twice the risk of death as those who were lean and fit.

Promoting Physical Activity in Childhood

• Physical activity should be increased by reducing sedentary time (e.g., watching television, playing computer video games, and talking on the phone).

• Physical activity should be fun for children and adolescents.

• Parents should try to be role models for active lifestyle and provide children with opportunities for increased physical activity.

Taras (2005) and Trost (2007) have experimented that Physical fitness and physical activity have been shown to have positive effects on cognition and concentration. While some published evidence positively links physical activity, fitness, or Physical Education to academic performance in the classroom, a few studies have utilized standardized fitness and academic achievement scores to examine these relationships.
World Health Organization

The World Health Organization (WHO), which is a specialized agency of the United Nations (UN), acts as a coordinating authority on international public health. It was established on April 7, 1948, with headquarters in Geneva and Switzerland.

Activities of WHO

WHO also conducts health research in communicable diseases, non-communicable conditions and injuries, for example, longitudinal studies on aging to determine if the additional years we live are in good or poor health and whether the electromagnetic field surrounding cell phones has an impact on health. Some of this work can be controversial, as illustrated by the April, 2003, joint WHO/FAO report which recommended that sugar should form no more than 10% of a healthy diet, for example, to boost the consumption of fruits and vegetables worldwide and to discourage tobacco use.

Statcher, et al., (2003) described that several studies have shown that healthy children perform better academically. Morris (1994) reported that regular practice of systematized physical activities may contribute to the improvement of several components of health-related physical fitness such as muscular strength, cardio respiratory fitness, flexibility, and body composition. These changes may especially favour the control of body adiposity as well as the maintenance or improvement of functional and
neuromotor capacity, hence, improving performance in several daily chores. Consequently, they provide better health conditions and more suitable quality of life to their practitioners.

**Purpose of Global School-based Student Health Survey (GSHS-WHO)**

The purpose of the GSHS is to provide accurate data on health behaviours and protective factors among students and to

a) help countries develop priorities, establish programmes, and advocate for resources for school health and youth health programmes and policies.

b) allow international agencies, countries, and others to make comparisons across countries regarding the prevalence of health behaviours and protective factors and

c) establish trends in the prevalence of health behaviours and protective factors by country for use in evaluation of school health and youth health promotion.

**Prevention Is Better Than Cure**

We all have grown up hearing the adage “Prevention is better than cure” since our childhood. We can prevent diseases by brushing teeth twice to protect them from decaying; washing hands before eating food to avoid stomach upset; avoiding uncovered street food; getting vaccinated
against diseases like polio; getting rid of stagnant water to stay clear of malaria and dengue; exercising to stay fit; and so on. No one wants to argue with these time tested measures, which, if followed, can reduce one's chances of contracting a disease and one can forget about trying to find a cure later.

Make it a habit to drink plenty of water. Ideally, one should drink at least 8 glasses of water a day. Water helps to be properly hydrated; it regulates digestion; and it softens stool. Water is the best to drink and cannot be substituted. Avoid alcoholic drinks and coffee because these will only dry stool. It is essential to increase water intake when engaged in strenuous activities.

A healthy digestion is also a key to prevent undergoing hemorrhoid cure. Good digestion stimulates regular bowel movement. Exercising daily, particularly walking for about 20 to 30 minutes a day, helps the digestive system. According to a survey, 51 per cent of the people in India feel that AIDS has a cure, 65 per cent do not use condoms while having sex with 'unknown' partners and only 73 per cent practice abstinence before marriage. About 95 per cent people believe that it can never happen to them. This is a telling picture of the crude information engulfing our society. In 2007, the number of people worldwide living with HIV is estimated to be 33.2 million, 2.5 million people became newly infected and 2.1 million people died of AIDS. The brutal truth is that this number includes 2.5 million children who get infected with HIV much before they actually get to know
about prevention. The transmission of the virus from HIV-positive mothers pushes 3,80,000 children to the jaws of death every year. Diseases like cancers at an advanced stage cannot be cured or almost impossible to get cured. Modern lifestyles and their pace do not leave people with enough time for healthy routines or care. However, periodic health check-ups should be done for early detection of fatal diseases.

**Statement of the Problem**

The purpose of the study is to analyze the Awareness of Health and Physical Fitness, the Status of Physical Fitness, and Academic Achievement among school boys and girls. The study was planned to investigate the effect of awareness in selected physical fitness tests and World Health Organization's Global School-based Student Health Survey Questionnaire.

**Hypotheses**

1. There is a significant difference in Awareness of Health and Physical Fitness among the groups of students of matriculation, central board of secondary education, management schools aided by the government, and government schools irrespective of the gender.

2. There is a significant difference in Awareness of Health and Physical Fitness between boy and girl students irrespective of different types of school, namely matriculation, central board of secondary education,
management schools aided by the government, and government schools.

3. There is a significant difference in Awareness of Health and Physical Fitness among each group of students, namely matriculation, central board of secondary education, management schools aided by the government, and government schools between boys and girls.

4. There is a significant difference in selected Physical Fitness variables among the students of matriculation, central board of secondary education, management schools aided by the government, and government schools irrespective of the gender.

5. There is a significant difference in selected Physical Fitness variables between boy and girl students irrespective of different types of school, namely matriculation, central board of secondary education, management schools aided by the government, and government schools.

6. There is a significant difference in selected Physical Fitness variables in each group of students, namely matriculation, central board of secondary education, management schools aided by the government, and government schools between boys and girls.

7. There is a significant and different relationship between Awareness of Health and Physical Fitness, Status of Physical Fitness, and Academic Achievement of school boys and girls.
Significance of the Study

1. This study may help to create Awareness of Physical Fitness among students, Physical Education Teachers, and Directors as well as parents.

2. The results of the study may be helpful to compare Awareness of Health and Physical Fitness among school boys and girls.

3. The results of the study may add to the quantum of knowledge in the concept of Health and Physical Fitness Awareness, and Status of Physical Fitness of high school boys and girls.

4. The findings of the study may provide guidelines to educationists, physical educationists, and health professionals to prescribe a plan of action for the betterment of higher education students community.

5. Based on the results of the study, suitable Health and Fitness Awareness programmes and campaigns may be prescribed.

6. The results of the study may help our sports administrators and policy makers evolve a concrete solution for the healthy way of living.

Delimitations

1. The students were selected from various types of school e.g., government school, government aided school, matriculation school, and CBSE schools in Tirunelveli district. The study was made only among 480 students.

2. Boys and girls were selected for this study. 16-18 age group students from 11th and 12th standard were selected as subjects in this study.
3. The students, who participated in this survey, were given suitable warm-up before they start their physical ability tests. Rotation and stretching exercises were given to the students before and after the tests.

4. Speed, Strength, Endurance, Flexibility, BMI, Health Awareness, Physical Fitness Awareness, and Academic Achievement were selected as criterion variables.

**Limitations**

The following limitations were considered while interpreting the results of the study.

1. Previous training status would not be taken for consideration.

2. Influence of participation in regular school physical activities and competitions were not taken for consideration.

3. Diet habits, cultural factors, and environmental factors were not considered.

4. The test could not be controlled during changes in atmosphere, pressure, and temperature during the period of administering the test.

5. Though the subjects were motivated verbally, no attempt was made to differentiate the motivation level during the period of testing.

6. The investigator made an attempt to avoid familiarity with the tests and serial fatigue while conducting the tests. However no attempt was made to find out whether the above said factors influenced the performance of the subjects.
Definition of Terms

Health

Health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic, and social condition.

Health is defined in the WHO constitution of 1948 as “A state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity” (“Health”, 2012).

Physical Fitness

Physical fitness implies the ability to function at one’s best level of efficiency in all his daily living.

The ability to function efficiently and effectively without injury, to enjoy leisure, to be healthy, to resist disease and to cope with emergency situations is physical fitness. Health-related components of physical fitness include body-composition, cardiovascular fitness, flexibility, muscular endurance, neuromuscular learning, and strength. Skill-related components include agility (defined as the ability to move in any direction quickly), balance (in multiple dimensions), coordination (hand eye and foot eye), reactions, rhythm, power, and speed in all directions. The relative importance of each of the components varies from person to person (“The ability”, 2012).
**Speed**

Speed is the ability to make rapid movements of the same type in the shortest possible time.

Speed is the scalar quantity that is the magnitude of the velocity vector ("Distance", 2012).

**Strength**

Strength is the amount of muscular force one is capable of exerting in a single muscular contraction.

Muscular Strength is defined as the ability of a muscle or muscle group to exert force and to overcome the most resistance in one effort (Luann Voza, 2010).

**Endurance**

This is the quality that enables a person to sustain localized body activities for extended periods of time.

Endurance means the act of working very hard without stopping even in the face of difficult situations or pain ("Endurance", 2012).

**Flexibility**

It is the functional capacity of a joint to move through a normal range of motion. It is specific to a given joint and is actually more dependent
upon the musculature surrounding a joint than on the actual body structure of the joint itself.

Flexibility is the ability to move a joint smoothly through its complete range of motion. There are two main types: static flexibility is the ability to move slowly into a stretched position and to hold the body stills (e.g., the ability to sit in a splits position); dynamic flexibility is the ability to move quickly or at normal speed into a stretched position (Oxford Food & Fitness Dictionary, 2012).

**Body Mass Index (BMI)**

Body Mass Index (BMI) is a relationship between weight and height that is associated with body fat and health risk. The equation is

\[ \text{BMI} = \frac{\text{body weight in kilograms}}{\text{height in metres squared}}. \]

A standardized estimate of an individual’s relative body fat calculated from his or her height and weight. The formula for calculating BMI is weight in kilograms (kg) divided by height in metres (m) squared (Brandon Peters, 2011).

**Academic Achievement**

Total average marks scored by the students in the examinations of the previous academic year through quarterly, half yearly, and annual examinations.
Academic achievement can be defined as excellence in all academic disciplines in class as well as extracurricular activities. It includes excellence in sporting, behaviour, confidence, communication skills, punctuality, assertiveness, arts, culture, and the like ("Academic achievement" 2012).