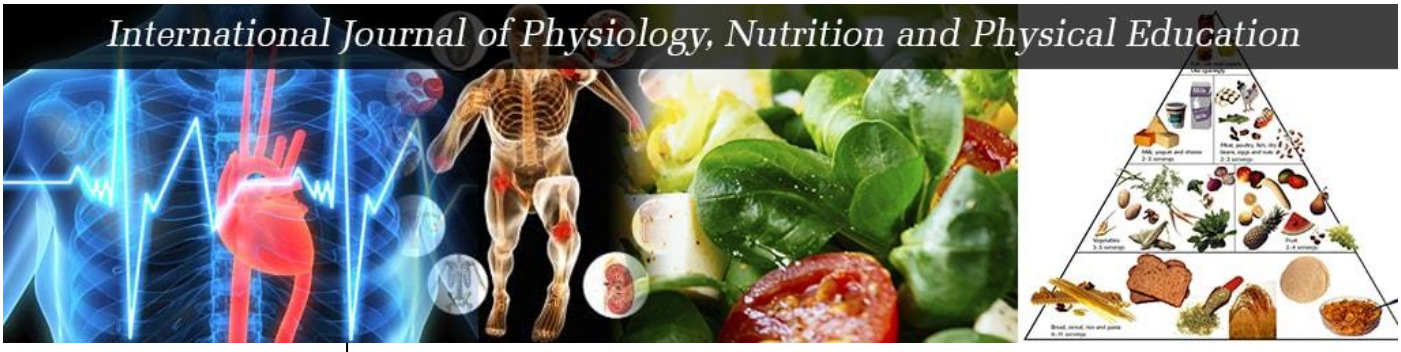


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# Comparison of physical fitness among rural, urban and tribal students of district Shopian

## Mukhtar Ahmad Wani and Dr. Manoj Pathak

**Abstract**
A great need is felt to educate the society about physical fitness and to bring awareness among the individuals. The benefits of regular exercise on psychological health have been clearly documented. The present study aims to measure the health-related physical fitness components of 11 to 12 years old school going boys from Rural, Tribal, and Urban schools in Shopian District to prepare the appropriate norms of health related physical fitness components (Body Height, C.V. Endurance, Muscular Strength & Endurance) of 11 to 12 years old school going boys and also compare age wise (Rural, Tribal and Urban) performance of the subjects in health related physical fitness components.

**Keywords:** Muscular Endurance, BMP, Bent knee, fitness, nutritional quantity etc.

## Introduction
It is self-evident that the fit citizens are a nation's best assets 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 for most of the tasks to be under taken by an individual in his daily life. The World Health Organization defines health as: "Health is physical, mental, social and spiritual well-being, not merely the absence of disease and infirmity." The World Health Organization (WHO) has set a target that every person in the world should become health conscious by 2000 AD and it is a right step in the attainment of health for all. Today fitness is needed for two reasons. Firstly, it is needed for taking part in competitive sports participations and secondly it is required for maintaining the health in a good condition. Pate writes that health-related physical fitness is relevant to all children. . Scientists and doctors have known for years that substantial benefits can be gained from regular physical activity (Manley, 1996). Today there are strong evidence suggesting that regular physical activity provides clear and substantial health gains. Physical activity is also directly related to preventing disease and premature death and to maintaining a high quality of life that its importance must be understood at all levels. Regular physical activity is an essential adjunct to normal growth and development. Through physical activity children become fitter and healthier. The programmers of physical education is intended not only to achieve physical fitness but also optimum organic health, emotional stability, social adaptability to take proper decisions and Uppal, develop skills that will enable a child to participate in various activities.4 In India, children become far less active as they move through adolescence and it is found that obesity is increasing among children. All these findings indicate that current physical education programs are inadequate to promote lifetime physical fitness. These findings have made physical educators realize that a change in curriculum is needed which would lead to development of attitude towards lifelong exercise behavior with special emphasis on health related fitness.

## Concept of Physical Fitness
Fitness concepts in elementary physical education center on children's understanding of fitness as good health, and a working knowledge of activities that promote a healthy level of fitness. 5 The World Health Organization (WHO) has defined fitness as "the ability to perform muscular work satisfactorily." The United States of America, centers for Disease Control and Prevention defined fitness thus:" the five health- related components of physical fitness are more

important to public health than are the components related to athletic ability. Operational definition of physical fitness varies with the interest and need of the investigators." Fitness: The definition of physical fitness might vary by individually but most experts agree that there are five basic components of physical fitness which involve your heart, lungs, strength, endurance, and agility or flexibility. 7 Happy child is nation's pride. Children are the world's greatest resources. More importantly, the vast majority of individuals who take up regular exercise report an improved sense of general well-being and an enhanced self-image.

**Significance of the Study**

The research has significance as it studies the health related physical fitness of the students from high schools comparatively by conducting various tests. There has been an increase in number of researcher in sports and physical education. The research will be helpful to the researchers studying various new components regarding fitness in sports.

- Comparing the various morphological (body height and body weight) and health related physical fitness components of school going boys it may help to prescribe suitable curriculum and means of evaluation.
- The study will be useful for motivating the students to achieve better level performance.
- The study provides an opportunity and encouragement to the sports talents in school level.
- The study will provide standard norms in favor of selection, assessment and evaluation of selected performance variables of school level going boys in Shopian District.
- The norms will help to discriminate the students of schools having excellent potential and talent.

**Objectives of the Study**

To measure the health-related physical fitness components of 11 to 12 years old school going boys from Rural, Tribal, and Urban school in Shopian District.

- To prepare the appropriate norms of health related physical fitness components (Body Height, C.V. Endurance, Muscular Strength & Endurance) of 11 to 12 years old school going boys.

To compare (age, Rural, Tribal and Urban) performance of the subjects in health related physical fitness components.

**Operational Definitions**

**Physical fitness components**

The physical fitness considered for this study is limited to selected physical fitness factors viz. Muscular Strength and Muscular Endurance and Body Composition.

**Muscular Strength**

Muscular Strength and Endurance in this study means the arms and shoulder muscle strength and endurance performance of 11 to 12 years school going boys measured through Push-ups.

**Muscular Endurance**

Muscular Endurance in this study means the abdominal muscle endurance performance of 11 to 12 years school going boys measured through one minute Sit-ups.

**Body Height**

Height in this study means the maximum height of the individual when standing erect.

**Body Weight**

Weight in this study means the maximum weight of the individual when measured through electronic weighing scale.

**Body Composition**

The body composition in this study means Body Mass Index and % Body Fat of boys.

**School going Boys**

The School going boys who are of age 11 years and 12 years. For the academic year 2019-20, student's birth date after 1 Jan. 1997 was considered for the present study.

- **Rural Schools**
  The schools that come under the jurisdiction of Zilla Parishads in Shopian District.
- **Urban Schools**
  Schools under the Municipal Corporation, which are aided and unaided in Nanded city**.**
- **Tribal schools**
  The Schools of remote area / places that are regulated by Zilla Parishad. Especially for Tribes in Shopian District.

**Review of literature**

Chung, Joanne WY. et, al performed a survey titled 'To Compare the Physical Fitness Levels of Hong Kong and Mainland Chinese School Children and to Study the Association Between any Differences and their Respective Life-style'. The study was conducted on Primary school children (n=522). Demographic data was collected by questionnaire. Physical fitness tests (height, body weight, sit and reach, long jump, running 50m and lung capacity) were carried out. Significant differences were found in height, body weight, sit and reach, long jump, running 50m and lung capacity. Hong Kong children were found to be taller and heavier at ages 6 and 7, but heavier with similar height to that of mainland children at ages 8-12. Other results showed better physical fitness on the part of mainland children. The Hong Kong children differ greatly. The findings in terms of physical fitness revealed variations in flexibility, cardiovascular function, body build and muscle power between the two groups.

Guerin, *et al.,* performed the study with the purpose to compare the body composition and cardio respiratory fitness Refugee Somali women were invited to participate in sessions to assess physical fitness and body measurements. Height, body weight and waist and hip circumference were measured. The Rockport Fitness Walk Test was used to estimate the women's cardio respiratory fitness levels. Thirty-one women between 12 and 66 years old participated in this study. There was a significantly greater proportion (71.4%) of participants with a BMI in the overweight or obese range (>or=25 kg/m2) compared to normative New Zealand women's data (49.3%; p = 0.015). The proportion of Somali women (42%) with a waist-to-hip ratio in excess of 0.8 was higher than that of New Zealand women (35.6%), but not statistically so. All women over 30 years of age (n = 12) had an estimated VO2max below the 50th percentile with eight participants below the $10^{th}$percentile. The extent of overweight and obesity and low fitness levels, particularly among the older Somali women in this study, suggests that Somali women are at increased risk of developing life-style related diseases.

Bovet, *et al.* examined the relationship between physical fitness and obesity in children have had mixed results despite their interrelationship making intuitive sense. We examined the relationship between physical fitness and overweight and

obesity in a large sample of adolescents in the Republic of Seychelles (Indian Ocean, African region). All students of four grades of all secondary schools performed nine physical fitness tests. These tests assessed agility, strength and endurance, and included the multi-stage shuttle run, a validated measure of maximal oxygen uptake. Weight and height were measured, body mass index (BMI) calculated. Data was available for 2203 boys and 2143 girls from a total of 4599 eligible students aged 12-15 years. The prevalence of overweight (including obesity) was 11.2% (95%confidence interval: 9.9-12.4) in boys and 17.5% (15.9-19.1) in girls. For 7 of the 9 tests, the relationship between BMI and fitness score, as assessed by locally weighted regression, was characterized by a marked inverse J shape. Students with normal body weight achieved "good" performance markedly more often than over-weight or obese students on 7 of the 9 tests of fitness and more often than lean children. For example, good performance for the multi-stage shuttle run was achieved by 25.6% (SE: 2.1) of lean students, 29.6% (0.8) of normal weight students, 7.9% (1.3) of over-weight students and1.2% (0.9) of obese students. This cross-sectional study shows a strong inverse relationship between fitness and excess body weight in adolescents. Improving fitness in adolescents, likely through increasing physical activity, might need special interventions that are responsive to the ability and needs of overweight children.

Vanderburgh, M. Paul (2007) conducted a study on defense personnel. Recent research findings combined with the theoretical laws of biological similarity make the compelling case that all physical fitness test items for the Army, Air Force, and Navy impose a 15 to20% physiological bias against heavier, not fatter, men and women. Using the published findings that actual scores of muscle and aerobic endurance scale by body mass raised to the 1/3 power, correction factor tables were developed. This correction factor can be multiplied by one's actual score (e.g., push-ups, sit-ups, abdominal crunches, or curl-up repetitions or distance run time) to yield adjusted scores that are free of body mass bias. These adjusted scores eliminate this bias, become better overall indicators of physical fitness relevant to military tasks, are easily applied to the scoring tables used in the present physical fitness tests, and do not reward body fatness. Use of these correction factors should be explored by all military services to contribute to more relevant fitness tests.

## Methodology

In this scientific inquiry, data collection was the next sequential step after defining the problem and formulation of the hypothesis.

## Research Methodology

The methodology of the research includes Survey observation. The purpose of this study was to standardize norms as well as have a comparison. The present research being a normative survey study, it goes through a method of survey research under descriptive one. Descriptive research involves describing current events or conditions. It is concerned with conditions or relationships that exist. The most common tool of descriptive research is survey. Descriptive statistics was used for obtaining mean and standard deviation. The percentile method was used to prepare the norms. A Test Battery for Health Related Physical fitness was formulated and administered. Norms of the same were established – scientifically and proper statistical design was employed for comparison.

### ❖ Justification for the Physical Fitness Test Selection

The research scholar reviewed the existing standardized tests as available in valuable sources by scholars in the field of physical education and taking into consideration the varied social and cultural traditions prevalent in Shopian District. The climatic and financial conditions and other factors such as, availability of playgrounds, equipment etc. in the secondary schools formulated an ideal battery of tests to be administered to the boys, which will not cover the basic components of physical fitness but also be enjoyable to the students and easy to administer. The following tests were administered to assess Physical Fitness. To find out the applicability of the test items on the present sample, the researcher determined the reliability. The test comprised of the following factors:

- Muscular Strength
- Muscular Endurance
- Body Composition (Body Height and Body Weight)

The above components were measured by the following test-items: Bent knee sit-ups test and push-ups test requires fewer resources, easy to administer in school setup and generally student knows its procedure. The most commonly method used for evaluating Muscular Strength and Endurance is one min. Push-ups and Bent-Knee Sit-Up. Literature in physical education establishes an exercise of Bent-Knee Sit-Up, if performed for one minute, can predict one's functioning level of abdominal muscles. The leading organization AAHPERD therefore, could incorporate "Bent-Knee Sit-Ups" event as one of the test-items Miller (2002). It requires less resource and is easy to administer in school setup and generally student knows its procedure. Age-height-weight tables have traditionally been used to determine underweight or overweight. However, research has shown that individuals of the same height, weight and age can vary significantly in body shape and body composition. Body Mass Index is also a good indicator of body composition. It is a rough measure of body composition that is based on the concept that a person's weight should be proportional to height. The most popular indices have been those of Cozens (1963), Nelson and Cozens (1934) and Mc Cloy (1954).

## Research design

A properly designed research only can guide the correct act to be done and indicates the steps to be taken in sequential manner for collecting the empirical data while verifying hypothesis. The research design is hence known as a "blue print" of research engine that guides the researcher in the data collection stages. Which gives direction to the investigator to observed weather his research process is on the right path or not. The design of the research has been implemented considering following stages.

## Population and Sampling

### ➢ Population

The population was the adolescent school going boys aged 11 to 12 years. 06 secondary schools are located in Rural, Tribal and Urban areas in Shopian District. In the age groups 11 to 12 years, approximately 200 boys were studied in secondary schools located in Shopian District.

### ➢ Sample

Out of 06 secondary schools, 02 Rural, 02 Tribal and 02 Urban schools were selected. From these 06 secondary schools all 11 and 12 years boys were the sample of this

study. In the age groups of 11 and 12 years taking about 200 boys in each age group, the number of sample for this study reached 200 students.

**Procedure of the Sample Selection**

The present research is a normative survey study that goes through a method of survey research under descriptive one. Since the Shopian District has expanded its periphery, the samples for the study were widely scattered. Hence, the *simple random technique* was used. The data was collected taking in account Tribal, Rural and Urban schools of Shopian District. The investigator hence proposed to randomly select 3000 students from each category i.e. Tribal, Rural and Urban high schools from the age group 11 to 12 years from 15 Talukas. In order to obtain sample representative of the entire district two Tribal, Rural and Urban schools from each of 15 Talukas in Shopian District were selected randomly. To make the study more authentic and reliable, the research scholar proposed to administer the tests. Out of 1000 boys, approximately 200 from each age group i.e. 11 and 12 years were selected randomly from 06 schools from the study area.

The subjects'

The data for present research study was collected by testing the male students in different Health Related Physical fitness components. The research scholar went to Nanded Corporation and obtained the list of names and addresses of different schools in Shopian District. The investigator reviewed the Taluka-wise list of high schools from statistical information of medium wise secondary school in Shopian District year 2016-17 (as shown Appendix- A). As per record of Corporation, there are near about 06 secondary schools in Shopian District in which medium of instruction is Marathi, Hindi, English and Urdu. 200 boys from age group 11 to 12 years have been studying in these 06 high schools (As shown Appendix- A). Most of the schools are co-educational with an adequate number of boys. Hence covering the proposed number of 200 boys was really feasible. The number of schools tested in each Taluka also differed. Since some Talukas have a large number of schools whereas others have just a few schools. However, it may be noted that the students from these schools hail from the remote Rural, Tribal and also from the Urban localities.

**Table:** the selected sample is a reliable representative of the entire Taluka

| Sr. No. | Test Item | To Measure | Equipment | Scoring |
|---|---|---|---|---|
| 1 | Push-ups | Muscular Strength | Mat or Flat surface | Number of Repetitions |
| 2 | One Minute Bent Knee Sit-ups | Muscular endurance | Mat or Flat Surface | Number of Repetitions |

- **Description and Measurement of Test items**
- **Body Height**

**Purpose:** To measure standing length of body.
**Equipment:** Flat surface, measuring tape, marker
**Procedure:** In measuring height, the only equipment and materials necessary are flat surface against which the student stands, measuring tape or marked surface and an object to place on the student's head that form a right angle to the wall or a black board. The measurement should be done without shoes. It has been suggested that standing with the back against a support helps the subject to stretch to his full height. The chin is tucked in slightly and head is held erect. Finally the subject bends his knee slightly when he steps away so as not to disturb the angle before the height is recorded.
**Scoring**: The height is recorded in centimeter.

- **Body Weight**

**Purpose:** To measure mass of the body.
**Equipment:** Weighing machine
**Procedure:** The student to be weighed should be wearing a minimum amount of clothing and shoes removed. While it may be more accurate for the students to be weighed in the nude but, it is often not practical or desirable. The subject should be weighed at the same degree accuracy.
**Scoring:** The weight is recorded in kilogram.

- **Push-ups**

**Purpose:** To measure strength and endurance of arms and shoulders.
**Equipment:** Mat or flat surface, scorecards, pencils and assistants.
**Procedure:** Start in the push up position - with the hands and toes touching the floor, the body and legs are in a straight line, feet slightly apart, and the arms and shoulder wide apart, extended and at right angles to the body. Keeping the back and knees straight, the subject lowers the body until there is a 90-degree angle at the elbows, with the upper arms parallel to the floor and then pushes upward to the straight arm support. The exercise is continued for as many repetitions as possible without rest in 60 sec. The body must not sag or pike upward but maintain the straight line throughout the exercises.
**Scoring:** The total number of pushups completed successfully is recorded as the score.

- **Sit-ups**

**Purpose:** To measure endurance of the abdominal muscles.
**Equipment:** An exercise mat or piece of a carpet and one assistant.
**Procedure:** Student lies on back with legs flexed at the knees and feet approximately 12inches apart. The hands are placed behind the head with fingers interlaced. A partner holds the student's ankles and keeps the feet in contact with the floor while counting each sit up. On the signal to begin, the student touches the chest both the knee and returns to the starting position. The examinee begins executing consecutive Sit-ups on the word "Go", using the signal "Ready, Go!" At the end of 60 seconds, the test is ended with the word 'Stop"! The score is the numbers of Sit-ups executed correctly during this time.
**Scoring:** The total number of Sit-ups successfully completed is recorded as the score. The test allows for a one minute time limit.

- **Body Mass Index (BMI)**

**Purpose:** To assess the proportion of the body
**Procedure**: Formula is used to measure body mass index. However, prior to that individual's body weight and height are to be measured and recorded. The formula is as follows:
BMI = Weight (kg) / Height $(m)^2$
**Scoring:** After calculation, the score of BMI is expressed in the form of index.

**Collection of Data**

The research scholar reviewed the scholastic calendar of high school for the academic year 2016-17 accordingly worked out a tentative schedule for administering the tests in various

centers in Shopian District keeping in view the school examinations, Annual functions, religious festivals, vacations etc.

**Intimation to schools**

A detailed circular was forwarded well in advance, to the Principal/ Headmaster of the selected schools. A copy of which was provided to the physical education teachers, informing them about the investigator's proposed study and requesting them to facilitate in administering the tests to the boys in their respective schools (as shown Appendix -C).

The relevant pro forma for the submitting the list of boys proposed to be tested, as per their age groups was prepared.

**Selection of Subjects**

➢ **Age groups**

In order to facilitate the schools in enlisting the boys for the tests, the following age groups were made class wise.

Group 1: 11years (6th Std.)

Group 2: 12 years (7th Std.)

➢ **Score sheet**

Appropriate score sheets were duly prepared for recording the scores of each test item separately. (As shown Appendix- E)

➢ **Testing schedule**

The research scholar started the work of collection of data during Feb. 2008. The six test items included in the test battery were split up into two sets and were conducted on two consecutive days as under

**First day**

a) Weight b) Height c) Sit and reach d) Push up

**Second day:**

e) 1 minute Bend knee Sit-ups f) 9 minute run or walk

**Testing center**

The testing centers for administering the tests were set up within an individual institution wherever adequate numbers of boys were available.

**Instrumentation**

The research scholar selected the following equipment after thoroughly checking their working conditions and accuracy

**Item Quantity**

**Sr. No. List of equipment's**

1. Electronic Split Time Watch 02 No.
2. Portable Weighing Machine 01 No.
3. 50 Meter Tape 01 No.
4. Whistles 05 No.
5. Whity 10 kg
6. Clapper 01 No.
7. Color Chalk 01 dozen
8. Pen 05 No.

➢ **Equipment and ground arrangement**

In order to ensure the reliability of the data collected, the research scholar took extreme care to provide standard equipment and necessary playground facilities at each testing centre.

**Testing stations**

Testing stations were set up at each testing centre to administer the tests systematically and within the schedule time. The number of testing stations depended on number of subjects being tested at the testing centre. The subjects were grouped age wise or class wise and each group was assigned to one testing station. Adequate numbers of officials were appointed at each station.

**Results**

- From the results It is observed that the distribution of the scores in body height, bodyweight, percentage body fat, BMI, Push-ups and Sit-ups of the subjects of age 11 years, 12 years, were mostly positively skewed and Platy kurtic in nature. The score obtained from Physical Fitness test represents normal distribution. Also graphical structure of data shows Bell shape. The Percentile norms of each test-item were developed and established in this piece of research especially for the boys of the schools of Shopian District, aged 11 to 12 years boys.
- Age-wise Comparison of Performance in Health Related Physical Fitness Components i.e. body height, body weight, BMI, % body fat, Muscular
- Strength and Muscular Endurance and Flexibility of the subjects' ages 11 years, 12 years are significantly different at the 0.05 level and the hypothesis (Ho1: There is no significant difference in Health Related Physical fitness components of Boys of each age group between 11 to 12 years from school in Shopian District) is rejected.
- Area-wise Comparison i.e. Rural, Tribal and Urban of Performance in Health Related Physical Fitness Components i.e. body height, body weight, BMI, % body fat, Muscular Strength and, Muscular Endurance and of the subjects' ages 11 years, 12 years are significantly different at the 0.05 level and the hypothesis (Ho1: There is no significant difference in Health Related Physical fitness components of Boys of each age group between 11 to 12 years from school in Shopian District) is rejected.

**Conclusion**

With the help of present investigation the following conclusion are drawn.

- The data collected from 200 subjects of 6 different schools and tested statically showed normal distribution for entire population was of each age group school Boys. Therefore the parametric statistics is applied instead of non parametric statistics. With the application of parametric statistics the norms were prepared for entire population of each age group.
- The values of variability, Skewness and Kurtosis of all the selected attributes of Health Related Physical Fitness Factors indicate that the data was well distributed and resides in the normal range of a probability.
- There are significant differences in almost all the variables of Health Related Physical Fitness between 11 to 12 years Boys' age groups and therefore, separate norms have been established.
- Percentile norms of Health Related Physical Fitness variables were found gradable.
- There is significant difference in body height, body weight, BMI,% body fat, Cardiovascular Fitness, Muscular Strength and Endurance of shoulder and arms, Muscular Endurance of abdominal muscle and posterior thigh muscle of Boys each age group between 11 to 12 years from school in Rural, Tribal and Urban area in

Shopian District.

- The Boys belonging to the age group 11 to 12 years showed similar type of differences in almost all the variables as described in the previous chapter.
- In age-wise comparison, significant differences in almost all variables are evident among the Boys of 11 to 12 years age groups.
- Area wise Comparison i.e. Rural, Tribal and Urban of performance in Morphological Variable was higher in Urban area than other area in all age group**s** i.e.11 years and 12 years school Boys. Muscular endurance in Rural area was higher than other area i.e. Urban and Tribal in all age group**s** i.e.11 years, 12years school Boys and it was also concluded that Muscular strength and Endurance in Tribal area was higher than other area i.e. Rural and Urban in all age group**s.**
- In age-wise Comparison, the mean performance of body Height, body weight, BMI, body fat percentage, Muscular strength and Endurance and Muscular endurance of 11 year school Boys were higher than other age groups school Boys i.e. 12 years. It was lower in 11 year age group school Boys. Thus, Rural, Tribal as well as Urban Boys had different status of various components of health related physical fitness and morphological variables. Therefore, almost all the null hypotheses (HO1,) formulated have been refuted.

**Contribution to the Knowledge**

- This study has a great impact in the field of physical education at the school level. The result of this study will help various academic and sports agencies in different manners.
- Suggestions from this study also guide the teacher education colleges to modify their curriculum according to current needs of the society.
- On the basis of the diagnostic tools (norms), Govt. can take immediate intervention to launch a suitable state Health Related Physical Fitness among the school students.
- This study throws a light on the importance of active lifestyle and prevention of lifestyle diseases, thereby motivating the parents, teachers & the students in adopting an active lifestyle.

**References**


1. AAHPERD. Health related physical fitness: technical manual. Washington, D. C.: American Alliance of Health, Physical Education, Recreation, and Dance, 1984.
2. Ajmer Singh, SR Gangopadhyay. Trends and practices in physical education in India. New Delhi: Friends Publications (India) P. 143. American College of Sports & Medicine (ACSM), (2005). Health related physical fitness assessment manual. Baltimore: Lippincott Williams & Wilkins, 1991, 3.
3. APPHER. American Association of Health Physical Education and Recreation, Youth Fitness Test Manual. Washington D. C., 1962, 3-25
4. AthichaPillai. Computation of norms for 12 minutes run and walks among school boys. Karaikudi: Unpublished Doctoral thesis, Alagappa University, 1991.
5. B Dwyer, E Davis. ACSM's Health Related Physical Fitness Assessment Manual. Sydney, 2005, 91.
6. Barrow HM. Principles of physical education. Philidelphia: Lea and Feiber, 1983, 77-80.
7. Barry Craig Andrew. Physical fitness levels of Canadian and South African School Boys. Dissertation Abstract International. 1976; 36:9
8. Boone Herman. A Comparison of Physical Fitness Level of Urban and Rural Boys. Completed Research in Health Physical Education and Recreation. 1967; 10:86
9. Bovet, Pascal, Auguste, Robert, Burdette, Hillary. Strong inverse association between physical fitness and overweight in adolescents: a large school-based survey, 2008. Retrieved on April 15, 2009 from http://www.find-healtharticles.com/rec_pub_17550617-strong-inverse-association-physical-fitnessoverweight-adolescents.htm
10. Corbin CB, Pangrazi RP. Are American children and youth fit? Retrieved on April 15, 2009 from, 1992. www.ncbi.nlm.nih.gov.
11. Gratton C, Jones I. Research method for sport studies. London: Rout edge Group, 2004, 93.
12. Camaione David. Fitness management. Brown communications, 1993, 3.