



# University News

A Weekly Journal of Higher Education

**Association of Indian Universities**

Vol. 48 No. 05 • February 01-07, 2010

**Sports: Serving Society with Excellence**

**Special Issue  
on the Occasion of**

**XIX New Delhi World Book Fair**

**January 30-February 07, 2010**



# **UNIVERSITY NEWS**

**A Weekly Journal of Higher Education**

Vol. 48 No.05

February 01-07, 2010

**Sports : Serving Society with Excellence**

**Special Issue**  
**On the Occasion of**  
**XIX New Delhi World Book Fair**  
**January 30 – February 07, 2010**

**Editorial Committee Chairperson : Prof. Beena Shah**

**Editorial Committee Members : Mr. Sampson David**  
**Dr. Youd Vir Singh**

**Editor : Dr. Sistla Rama Devi Pani**

# Health Related Physical Fitness of Adolescents

**Bhavani Ahilan**

*(Ph.D. Scholar, Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu. sathabhavani@yahoo.com)*

**V Gopinath**

*(Reader, Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu. vgnath2007@rediffmail.com)*

Lifestyles affect people's health, with eating habits and regular physical activity being the two most influential factors (Panagiotakos, 2004) irrespective of sex, age or country of residence (Yusuf, 2004). An appropriate way to assess health in apparently healthy people is to measure their health-related fitness, defined as the dynamic state of energy and vitality that allows people to perform daily tasks, enjoy active leisure and cope with unexpected emergencies without undue fatigue. At the same time, health-related fitness helps in the prevention of hypo kinetic diseases, in maximum development of intellectual capacity, and in full enjoyment of life (Bouchard, 1993). Although regular physical exercise has a positive influence on health, a high level of fitness-related health has a greater influence (Eriksson, 2001 & Myers, 2004).

Major physiologic, cognitive, and behavioral changes take place during this period. During the period of adolescence, biological development and psychosocial development overlap. A person's body undergoes dramatic changes.

World Health Organization (WHO) defines it as the period of life between 10 - 20 years of age. There are three distinct phases of transition from adolescence to adulthood. Early adolescence (10-13 years): mainly characterized with physical maturity with onset of puberty, mid adolescence (14-15 years): with development of separate identity from parents and opposite sex, and finally the late adolescence (16-19 years): denoted as fully developed physical characteristics, formed a distinct identity and well developed opinion and ideas (Pandey et al., 1999). It is clear that the mid and late phases of transition are more important because pace of mental and physical development is rapid in these stages. Therefore, social scientists and researchers are mainly focused on adolescents aged 15-19 years to understand the transition.

India is the second most populous country in the world with total population of over 1081 million.

Adolescents (10-19 years) form a large section of population – about 22.5 per cent, that is, about 225 million. They are living in diverse circumstances and have diverse health needs. The total population of young people (10 – 24 Years) is approximately 331 million comprising nearly 30 per cent of the total population of India (Census, 2001). They are a positive force for a Nation and are responsible for its future productivity provided they develop in a healthy manner.

Adolescent psychology is associated with notable changes in mood sometimes known as mood swings. Cognitive, emotional and attitudinal changes which are characteristic of adolescence, often take place during this period, and this can be a cause of conflict on one hand and positive personality development on the other. Because the adolescents are experiencing various strong cognitive and physical changes, for the first time in their lives they may start to view their friends, their peer group, as more important and influential than their parents/guardians.

The unique strength of physical education and sports exists in its capacity to enthuse a dream in successive young generations. The life style of today's generation has changed tremendously. The fitness level of individual has gone down badly. Students prefer video games rather than to toil sweat in the play fields. Now Kids are suffering more and more from postural deformities. The only way to remove these factors from society, the roll of Physical Education and Sports become massive. It not only improves the health of an individual but also make him stronger mentally to face the huge competition present in today's fast changing world. Various postural deformities if cured at teenager age can reduce the risk of complications.

The survey revealed the eye opening facts of the students of public schools of Delhi. According to survey 55 per cent of students are over weight and chances of heart attacks, diabetic problems, hair loss. Blood pressure is much more in these students. According to the UNESCO Charter of Physical Education and sports,

1978,"Every human being has a fundamental right to access to physical education and sport, which are essential for the full development of his/ her personality. The freedom to develop physical, intellectual and moral powers through physical education and sport must be guaranteed both within the educational system and in other aspects of social and health life."

Over the past decade there has been growing acceptance that young people between 10 and 24 years of age are a distinct population group with needs that differ from those of infants or adults'. Youth from marginalized groups and lower- and middle-income countries are especially vulnerable. In 2000, it has been estimated that approximately 1.4 million adolescents aged between 10 and 19 years lose their lives through injuries and accidents, violence, suicide, pregnancy-related complications and other preventable illnesses. The nutrition transitions to lipid-rich diets and a decrease in physical activity have also seen an increasing prevalence in obesity, especially among urban youth.

Physical fitness 'A set of attributes that people have or achieve relating to their ability to perform physical activity' (Howly, and Franks, 1997). Physically fit individuals can accomplish the ordinary tasks of life (e.g., carrying groceries, climbing stairs, gardening) with less fatigue, storing up an energy reserve for leisure-time exercise or unforeseen emergencies. As summarized by Dr. Harrison Clarke, one of America's most noted fitness leaders during the 1960s, "Physical fitness is the ability to last, to bear up, to withstand stress, and to persevere under difficult circumstances where an unfit person would give up. Physical fitness is the opposite of being fatigued from ordinary efforts, to lacking the energy to enter zestfully into life's activities, and to becoming exhausted from unexpected, demanding physical exertion (Shephard, 1994).

The American College of Sports Medicine (ACSM) has defined health related physical fitness as "a state characterized by an ability to perform daily activities with vigor and a demonstration of traits and capacities that are associated with low risk of premature development of the hypo kinetic diseases (i.e, those associated with physical inactivity)." Health-related physical fitness consists of those components of physical fitness that have a relationship with good health. The components are commonly defined as body composition, cardiovascular fitness, musculoskeletal fitness (flexibility, muscular endurance, and muscular strength.) (Nieman, 1998).

*Body Composition* that relates to the relative amounts of muscle, fat, bone and other vital parts of the body is the only non-performance measure among the health-related physical fitness components (PCPFS,2009). *Cardiovascular Fitness* that relates to ability of the circulatory and respiratory systems to supply oxygen during sustained physical activity. *Musculoskeletal Fitness* refers to muscular strength, muscular endurance and flexibility. *Muscular strength* relates to the ability of the muscle to exert force. *Muscular endurance* relates to the muscle's ability to continue to perform without fatigue. *Flexibility* that relates to the range of motion available at a joint. This is used in day-to-day life in activities such as climbing stairs, digging the garden and cleaning (Shephard, 1994).

Health-related fitness includes the five major components of fitness directly related to optimum of health. Increases muscle tone, strength efficiency of the respiratory and circulatory systems, energy level and academic achievement, improves blood pressure, self-esteem, self-confidence, bone mineral density, and posture, decreases risk of cardiovascular disease, stroke, risk of diabetes, some cancers, body fat metabolism, susceptibility to injuries and illness, and reduces risk of osteoporosis.

## Conclusion

In response to 'population momentum', adolescents constitute a major share to total population in India. Adolescence, a dynamic period of physical and psychological growth, presents young people with a variety of developmental challenges that can have a significant impact on health-related behaviors. Because adolescents exhibit distinct patterns of morbidity and mortality, health practitioners are focusing increased attention on their unique health care needs.

Physical inactivity is a major risk factor for cardiovascular disease (CVD; Berlin and Colditz, 1990). Studies of children living in Iowa, Los Angeles, and New York City found high levels of obesity, serum cholesterol, and blood pressure, and more than 25 per cent of all children studied had at least one elevated CVD risk factor (Wheeler *et al.*, 1983). Adolescents may adopt behavior patterns that, if sustained through adulthood, may significantly affect their health. Continued involvement in physical activity through the life course may prevent or delay morbidity and mortality from chronic diseases such as CVD (Simons-Morton *et al.*, 1988; Ross *et al.*, 1987; American College of

Sports Medicine, 1988). In addition, evidence suggests that participation in physical activity effectively promotes long-term weight loss in adolescents (Epstein *et al.*, 1985; Becque *et al.*, 1988), and may play a role in preventing further increases in childhood obesity. Regular participation in physical activity also is associated with increased longevity (Blair *et al.*, 1989) and decreased risk of coronary heart disease (Paffenbarger and Hyde, 1984). Exercise as a type of “preventive” medicine can be effective in the prevention and treatment of diabetes, hypertension, and a wide variety of other medical conditions (DiNubile, 1993).

There are many other benefits associated with participation in physical activity across the life span. Active participation in physical activity in childhood and adolescence is believed to enhance the uptake of calcium in the bones (Chestnut, 1990), and bone health throughout life should be improved (Smith *et al.*, 1990). Increased physical activity also is associated with higher levels of beneficial high density lipoprotein (HDL) cholesterol in children (Thorland and Gilliam, 1981) and reduced risk of other priority health issues such as reduction in pregnancies, drug use, and violence, as well as academic improvement and lower high school dropout rates (DiNubile, 1993). Physical activity by children is inversely associated with blood pressure (Strazzullo *et al.*, 1988), serum lipoproteins (except HDL, which physical activity is positively associated; Durant *et al.*, 1983), and obesity (Clark and Blair, 1988; Walberg and Ward, 1985).

Therefore, low educational status and economic conditions with young age make more vulnerable. To rise age at marriage and education with provide quality of care through target oriented programme to adolescents especially awareness of health related physical fitness may improve the status of adolescents in our country.

### Implication

Some reasonably well-established facts regarding the characteristics of physical activity or exercise that contribute to an improvement in health-related physical fitness or clinical status include these:

- Physically active people at all ages exhibit fewer health problems than the very sedentary. Some of this difference may be due to self-selection or associated health habits. Thus, the entire difference may not be caused by physical activity. Both observational and experimental data are available to support the causal role for exercise in

both improved health-related fitness and decreased clinical manifestations of selected disorders.

- Extreme inactivity has significant detrimental consequences on health status, but these effects are rapidly reversed by ambulation, the upright posture, and gravity. Thus, low-intensity activity has major health consequences for the very inactive.
- The health benefits attributable to physical activity are relatively greater at the lower levels of activity. The improvement is greatest when the least-active individuals in the population are compared with the moderately active (expenditure of 200 to 300 kilocalories per day difference) with much less effect apparent between the moderately active and the very active.
- Most benefits of exercise are produced by movement requiring the dynamic and rhythmic use of large muscles for an extended period of time. This exercise is most effective when it is performed frequently (daily to at least every third day) and at a moderate intensity relative to the individual’s capacity. Additional benefits are provided by heavy resistive exercise that develops strength and exercises that increase flexibility.
- Aerobic exercise performed at a moderate intensity (more than 50 per cent of VO<sub>2</sub>Max or heart rate reserve) for a duration that results in an energy expenditure of more than 4 kilocalories per kilogram of body weight per session at least every other day should be the minimum goal of adults who are otherwise sedentary.

### References

1. American College of Sports Medicine. (1988). Physical fitness in children and youth. *Medicine & Science in Sports Exercises*, 20, 422-23.
2. Becque, M. D., Katch, V. L., Rocchini, A. R, Marks, C. R., and Moorehead, C. (1988). Coronary risk incidence of obese adolescents: Reduction by exercise plus diet intervention. *Pediatrics*, 81, 605-612.
3. Berlin, J. A., and Colditz, G. A. (1990). A meta-analysis of physical activity in the prevention of coronary heart disease. *American Journal of Epidemiology*, 132, 253-282.
4. Blair, S. N., Clark, D. G., Cureton, K. J., and Powell, K. E. (1989). Exercise and fitness in childhood: Implications for a lifetime of health. In Gisolfi, C. V. and Lamb, D. R. (eds.). *Perspectives in Exercise Science and Sports Medicine*, Vol. 2, Youth, Exercise and Sport Indianapolis, Benchmark, IN.
5. Bouchard, C., and Shepard RJ. (1993). Physical activity, fitness and health: the model and key concepts. In:

- Champaign: Human Kinetics*, 11–24.
6. Chesnut, C. H. (1990). Is osteoporosis a pediatric disease? Peak bone mass attainment in the adolescent female. *Public Health Report Supplement*, 50-54.
  7. Clark, C. D., Blair, S. N., and Corlan, M. R. (1988). Are HPE teachers good role models?, *Journal of Physical Education in Recreation and Dance*, 54 ( 7), 76-80.
  8. Di Nubile, N. A. (1993). Youth fitness—Problems and solutions: Paper presented at The Health Status of American Children and Youth, *American Health Foundation*, New York. *Preventive Medicine*, 22, 589-594.
  9. Durant, R. H., Linder, C. W., and Mahoney, O. M. (1983). The relationship between habitual physical activity and serum lipoproteins in white male adolescents. *Journal of Adolescent Health Care*, 4, 235-239.
  10. Epstein, L.H., Wing, R. R., Koeske, R., and Valoski, A. (1985), *A comparison of lifestyle, exercise, aerobic exercise, and calisthenics on weight loss in obese children*. *Behav. Ther*, 16, 345-356.
  11. Eriksson, G. (2001). Physical fitness and changes in mortality: the survival of the fit test. *Sports Medicine*, 31,571–6.
  12. Haskell, William L., Montoye, Henry, J., and Orenstein, Diane. (1985). Physical Activity and Exercise to Achieve Health-Related Physical Fitness Components. *Public Health Reports*, March-April, 100, No. 2 209, 202-212.
  13. Howly, T., and Franks, B.Dan. (1997). *Health Fitness Instructor's Hand book* (3<sup>rd</sup> edition). United States of America, Human Kinetics, p23.
  14. Jejeebhoy, Sand M., and Sebastian. (2003), Actions that Protect: Promoting Sexual and Reproductive Health and Choice among Young People in India. Regional working paper 18. Delhi: Population Council.
  15. Myers, J., Kaykha, A., George, S., Abella, J., Zaheer, N., Lear S, et al. (2004). Fitness versus physical activity patterns in predicting mortality in men. *American Journal of Medicine*, 117, 9, 12–8.
  16. Nieman, David .C. (1998).The Exercise health Connection. United States of America: *Human Kinetics*.p 04.
  17. Paffenbarger, R. S., and Hyde, R. T. (1984). Exercise in the prevention of coronary heart disease. *Preventive Medicine*, 13, 3-22.
  18. Panagiotakos, D.B., Pitsavos, C., Chrysohoou, C., Skoumas, J.,Tonsoulis, D.,and Toutouza, M.(2004). Impact of lifestyle habits on the prevalence of the metabolic syndrome among Greek adults from the Attica Study. *American Heart Journal*, 147,106–12.
  19. Pandey, J., Yadav, S. B., and Sadhu, K.K. (1999). *Adolescence Education in Schools: Package of Basic Materials*. New Delhi: NCERT.
  20. Ross, J. G., Pate, R. R., Corbin, C. B., Debly, L. A., and Gold, R. S. (1987). What is going on in the elementary physical education program? *Journal of Physical Education in Recreation and Dance*, 58, 78-84.
  21. Shephard, Roy.J. (1994). *Aerobic Fitness health*. United States of America, Human Kinetics Publishers, p21
  22. Simons-Morton, B. G., Parcel, G. S., O'Hara, N. M., Blair, S. N., and Pate, R. R. (1988). Health related physical fitness in childhood: Status and recommendations. *Annual review of Public Health* 9, 403-425.
  23. Smith, E. L., Smith, K. A., and Gilligan, C. (1990). Exercise, fitness, osteoarthritis, and osteoporosis." In Bouchard, C., Shephard, R. J., Stephens, T., Sutton, J. R., and McPherson. D., (eds.), *Exercise, Fitness and Health: A Consensus of Current Knowledge*. Champaign, Human Kinetics, I L.
  24. Strazzullo, P., Cappuccio, F. P., Trevisan, M., et al. (1988). Leisure time physical activity and blood pressure in school children. *American Journal of Epidemiology*, 127, 726-733.
  25. The President's Council on Physical Fitness and Sports, (PCPFS, 2009). This page was last updated on 06/16/2009.[http://www.fitness.gov/council\\_pubs.htm](http://www.fitness.gov/council_pubs.htm)
  26. Thorland, W. G., and Gilliam, T. B. (1981). Comparison of serum lipids between habitually high and low active preadolescents. *Medicine and Science Sports in Exercises*. 13, 316-321.
  27. Walberg, J., and Ward, D. (1985).Role of physical activity in the etiology and treatment of childhood obesity. *Pediatrician* 2, 82-88.
  28. Wheeler, R. C., Marcus, A. C., Allen, J. W., and Konugres, E. (1983). Baseline chronic disease risk factors in a racially heterogeneous elementary school population. The "Know your body" program, Los Angeles. *Preventive Medicine*, 12, 569-587.
  29. Yusuf, S., Hawken, S., Ounpuu, S., Dans, T., Avezum, A., and Lanans, F. (2004). Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the Inter heart Study): case-control study. *Lancet*, 364,937–52.
  30. [www.whoindia.org/en/Section6/Section425.htm](http://www.whoindia.org/en/Section6/Section425.htm)
  31. [living.oneindia.in/health/wellbeing/adolescence.html](http://living.oneindia.in/health/wellbeing/adolescence.html)
  32. [en.wikipedia.org/wiki/Teenager](http://en.wikipedia.org/wiki/Teenager)
  33. [en.wikipedia.org/wiki/Adolescent\\_sexuality](http://en.wikipedia.org/wiki/Adolescent_sexuality)
  34. [www.who.int/topics/adolescent\\_health/en](http://www.who.int/topics/adolescent_health/en) □