

SPORTS, EXERCISE AND HEALTH

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Introduction

One of the most rapidly growing fields of specialization in Physical Education is that of Exercise Physiology. It is the study of the effects of exercise of the body. The changes can be short term or long term. It is therefore important to discuss and understand the terms Physical activity, fitness, sport, exercise and health.

Physical Activity:

Physical Activity is defined as any bodily movement produced by the skeletal muscles that result in the expenditure of energy. Some examples of Physical activity are daily living tasks, occupational tasks, conditioning activity and sports activities.

Physical Fitness:

Individual who are physically fit possess the stamina to perform daily tasks, the energy to engaged in activities. leisure time pursuits the physical resources to meet unforeseen emergencies without undue fatigue, and the vitality to perform at their fullest capacity. It can further be divided into (a) Health-related fitness and (b) Motor performance-related fitness.

(a) Health related fitness is concerned with development and maintenance of fitness components through regular exercise program that can enhance health through preventive and remediation of one's ability to function efficiently and maintain a healthy file style. Thus, health related fitness is important for all individual throughout life through regular exercise.

(b) Motor performance related fitness is concerned with the development and maintenance of those fitness components that are conducive to performance of physical activity such as sports.

Sports:

It can be defined as physical activities with established rules engaged in by individuals attempting to outperform their competitors.

Exercise:

It is physical activity that is planned, structured, and repetitive and has as its objectives the improvement or maintenance of physical fitness,

Health:

It comprises several dimensions: physical, mental, social, spiritual and emotional health. Traditionally, the public has viewed good health as the absence of disease. Given this perspective if an individual was not sick, he/she was, by definition, healthy.

Causes of Cardiovascular Diseases

Sports, exercises and health are interrelated to each other. Before the effect of exercises on cardiovascular system is studied, it is important to know the causes and risk factors of cardiovascular diseases among the people of the World.

A study was conducted in USA during 1960 which showed that of all the death in USA, more than half are due to cardiovascular disease.

Another major health problem is obesity. Generally those persons are considered obese if they weigh, 20% more than their 'Ideal' body weight. Cardiovascular disease is statistically and physiologically related to obesity. The obese individual has a mortality rate 2-1/2 times more than the individual with an average or below average body composition or weight.

Since the major causes of obesity are over eating and physical inactivity. This means that chronic sports and exercise training can significantly reduce both the problems of obesity and cardiovascular diseases.

The most common types of cardiovascular diseases are:

1. Heart-attack or coronary heart-disease.
2. Stroke or apoplexy
3. Hypertensive diseases

Causes of Heart Attacks:

About 65% of the deaths due to cardiovascular diseases are due to heart attacks. The major causes of coronary heart disease is ATHEROSCLEROSIS, a slow progressive disease involving the narrowing the lumen of the coronary arteries by fatty substances. calcium and other cellular. stuffing's being deposits on the inside wall of the arteries.

The arteries also become stiff causing numbness of the body region, reduced organ function, chest pain (Angina) at it and during exercise. In advanced stage the blood flow through the artery is completely stopped, resulting in stroke, heart attack, even death.

The severity of the attack is associated with the exact location of the block with in the artery.

Risk Factors Associated with Heart Attack:

Some of the known-risk factors are

1. Age
2. Heredity
3. Obesity
4. Tobacco smoking
5. Exercise
6. Cholesterol or percentage fat in the diet
7. Blood-pressure
8. Gender and
9. Stress

Age: Generally the older you are, the greater your risk for heart-attack

In every	Age(25-34)	Age (55-64)
100000	10 (heart attacks)	1000 (heart attacks)

The increase is 100 fold from age group (25 — 34) to (55 — 64)

Heredity: Heredity plays important role in risk of heart attacks people having early age attacks have family history. It is difficult to find the exact way in which heredity plays a role it is possible that family life styles, including eating habits and physical exercise patterns are important in developing tendency towards heart-attacks.

Obesity: As already stated people with 20% overweight have 2-1/2 time greater chances of heart attacks.

Tobacco Smoking: The more cigarettes smoked per day and longer one smokes, the greater the risk of coronary heart disease and lung cancer. The risk of coronary heart disease is greater in smoking than is the risk of lung cancer.

Exercise: Many studies have been conducted which infer that exercise and coronary heart disease are related. The risk of heart attack is less the more physically active you are.

Blood Cholesterol (Lipid) Levels: The fast food and diet of northern India is typically very rich in foods containing large amounts of animal fats and cholesterol which is related to high incidence of coronary heart-disease.

Blood-Pressure: High blood-pressure or hypertension is another risk factor associated with coronary heart diseases. Habitual exercise has been shown to be effective in reducing blood pressure to near normal values.

Gender: the incidence of coronary heart diseases is greater in young males than in young females. In older age the risk is nearly the same. This is probably related to the production of ESTROGEN hormone. After menopause the estrogen level in woman drops drastically.

Stress: The people who exhibit higher level of aggression, competition and drive or who seems to be "racing the clock" this type of persons have been linked with increased risk of coronary heart disease.

The Big Three Risk Factors:

Of all the mentioned risk factors the three most important once are –

- a) Cigarette smoking
- b) High blood-pressure
- c) High blood level of cholesterol

If all three primary risk factors are present, the danger of heart attack is five times that when none are present.

Stroke and Hypertensive Diseases:

A stroke occurs when there is interference with the blood supply to the brain which cuts off oxygen supply. This can be caused by clot in arteries and is called thrombosis. The bursting of an artery can also cause stroke. This is called cerebral hemorrhage. High blood pressure is one of the main reasons for this.

The risk of stroke if you are a 45 years old male, smoke cigarettes, and have high blood cholesterol and high blood pressure is over ten times that of a male of the same age with none of these risk factors.

Effect of Sports and Exercise on Health

The 1984 data of Puffin Barger and colleagues suggest that physical activity benefits may not be limited to the primary prevention of coronary heart diseases. The data shows that the persons who exercise also have a lower incidence of stroke, respiratory diseases, all cancers and deaths from all causes than persons who do not exercise. Recent studies have shown that exercise participation increases the life span.

Vessel Size: The size of the coronary vessel increases following regular sports and exercise. The size of coronary arteries of Clarence Deislar, the famous marathon runner who ran till the age of 69 were found to be 2-3 times normal size.

Blood Cholesterol (Lipid) Levels: Exercise not only lowers total blood cholesterol but also increases the fraction of cholesterol known as high-density lipoproteins (HDL) and decreases the low-density lipoproteins (LDL) fractions. HDL is protective against coronary heart diseases where as LDL is not.

Several studies have shown exercise training to causes decrease in total blood cholesterol, triglycerides and LDL concentrations and increase in HDL cholesterol both in man and woman.

Blood Pressure: Exercise causes decrease in blood pressure. Particularly in those subjects who are hypertensive.

The Exercise Prescriptions:

The exercise program should be individualized and specific to the group for which they are designed. The basis of individual exercise prescriptions is -

1. Medical Evaluation:
 - (a) Medical history through questionnaires or review
 - (b) Physical examination — heart, lungs, muscles and bones
 - (c) Resting ECG
 - (d) Resting systolic and diastolic blood pressure
 - (e) Stress tests on treadmill/bicycle ergometer
2. . Quality and Quantity of Exercises Program:

The questions arises "How much exercise is enough? What type of exercises is best for developing and maintaining fitness?" These questions can be answered by four factors.

- (a) Frequency of Training: 3 to 5 days per week.
- (b) Intensity: The exercises should be enough so that your target heart-attack (THR) will be between 60 to 90 % of your maximum heart rate reserve (HRR). The middle

age persons can work at 3s-45% of HRR and older people (60-70 years) at 30-45% of HRR.

- (c) Duration of Exercises: Duration will depend upon intensity. Lower the intensity longer the duration. The time should be in between 15-60 minutes per day. To attain "Total Fitness" effect lower to moderate intensity of longer duration is recommended for non-athletic adult (e.g. exercises at a THR of 70% HR.R for 60 minutes rather than at a THR of 90 % for 15 minutes).

A study on 7000 men average age 66 years, conducted by Harvard alumni health study published in issue of circulation: Journal of American Heart Association as reported in Hindustan Times dated 18th February 2003 states that when it comes to exercise, your body knows the best. The intensity of exercises needed to reduce the risk of heart disease depends on how fit you are.

3. Mode of Exercises:

The types of exercises to be used should involve —

- (a) Large muscles groups i.e, legs
- (b) Can be continuously maintained
- (c) Should be rhythmical and aerobic in nature

Such exercises are —

- (a) Running – jogging
- (b) Walking hiking
- (c) Swimming
- (d) Bicycling (Road and Ergometer)
- (e) Rowing
- (f) Rope skipping
- (g) Dancing
- (h) Aerobics

Other common exercises are Tennis, Badminton and other Racket-ball exercises.

Conclusion:

A health promotion programs can assist an individual to become aware of the health risks associated with leading an inactive life style. The individual should incorporate sports and

exercises into his or her life style thereby reducing the individual's risk of diseases and contributing to a more favourable health states.

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