Chapter 7: Benefits of Physical Fitness

Objectives

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1) Identify the components and health benefits of physical fitness.
2) Identify types of exercises that promote physical fitness.
3) Explain the role of diet, exercise, and sleep in physical fitness.

Benefits of Physical Fitness

7.1 Benefits of Physical Fitness

7.1.1 What Is Physical Fitness?

Physical fitness is a level of health characterized by muscular strength, muscular endurance, flexibility, cardiovascular endurance and a lean body composition. Physical, mental and social benefits are gained from physical fitness.

- **Muscular strength** is the amount of muscular force exerted against resistance.
- **Muscular endurance** is the ability to continue using muscular force without tiring.
- **Flexibility** is the ability to move the body through a full range of possible motion.

Benefits of having muscular strength, endurance, and flexibility include tiring less easily, improved performance in sports, less likelihood of injuring your muscles, or suffering from low backache, the body does not get stiff easily, and the stiffness of old age may be prevented.

Cardiovascular Endurance

7.1.2 Cardiovascular Endurance

Cardiovascular endurance is the ability to sustain vigorous activity that requires increased oxygen intake for extended periods of time, e.g., swimming several laps in a pool. Persons with cardiovascular endurance have greater cardiac output and greater oxygen consumption during activity and exercise and slower heart rate at rest.

Cardiac output is the amount of blood pumped by the heart each minute. it is equal to the heart rate multiplied by the stroke volume (amount of blood pumped with each beat). Cardiovascular endurance depends on the frequency, intensity, and duration of exercise. Its benefits include a stronger heart and diaphragm, less atherosclerosis (Narrowing of arteries by fat deposits on the arterial

walls), and increasing the ratio of high-density lipoprotein (HDL) to low-density lipoprotein (LDL).

HDLs (good cholesterol) transport the extra fat in the blood to the liver to be removed from the body.

LDLs (bad cholesterol) contribute to the fatty deposits in arterial walls.

Body Composition

7.1.3 Body Composition

The tissues of the body are 1-fat tissue (fat in fat cells under the skin and around internal organs), and 2-lean tissues (muscle, bone, cartilage, internal organs…). Body composition is influenced by factors such as 1) heredity; the number of fat cells in a body is constant but they can become smaller in size, 2) gender; males usually have 16-19% body fat; females have 22-25%, 3) regular exercise to promote cardiovascular endurance decreases the ratio of fat to lean tissues, 4) age and physical activity; decreasing physical activity with aging decreases muscle mass and increases the proportion of body fat.

The area where fat tends to accumulate in the body may influence susceptibility to heart disease (greater susceptibility for the abdominal area –the apple configuration- than for the area of the hips – the pear configuration).

Types of Exercises

7.1.4 Types of Exercises

Different types of exercises confer different benefits. A variety of exercises is needed to acquire physical fitness.

Isometric exercises

Isometric exercises: involve contracting muscles for 5-10 second periods without muscle shortening, i.e., without movement, e.g., pushing against a wall. Isometric exercises increase muscle strength and bulk without much effect on flexibility or cardiovascular endurance. They should be avoided by persons with heart problems because they can cause a sudden rise of blood pressure.

Isotonic exercises

Isotonic exercises: involve contraction and movement of muscles, e.g., walking and sport activities. Isotonic exercises should be started gradually, e.g., start with 10 curl-ups and 5 push-ups and gradually increase the number of each in subsequent exercise sessions. Muscular strength and flexibility are promoted, and some exercise will improve cardiovascular endurance if performed at certain intensity for a specified duration.

Isokinetic exercises

Isokinetic exercises: involve movement of a weight or resistance through an entire range of motion. Some exercises utilize weight plates; others involve pressurized air.

Benefits include flexibility, strength and muscular endurance. It is important to get help at an exercise club to determine how much weight you should lift, when to increase resistance, and how many repetitions to perform at each station.

Aerobic exercises

Aerobic exercises: involve breathing (using oxygen) for at least 15-20 minutes of continuous exercise, e.g., aerobic dancing, speed walking, distance running or swimming. They promote cardiovascular endurance, some flexibility and muscle strength. An additional benefit of regular aerobic exercise is making cancer patients feel better physically and mentally. For maximum benefit, aerobic exercises should be performed at target heart rate, 3-5 days per week, each exercise session including 15-60 minutes of continuous aerobic activity; longer duration and less intensity being favored.

Target heart rate

Target heart rate (THR) is equal to resting heart rate (RHR) plus 60-90% of the difference between maximum heart rate (MHR) and resting heart rate.

Lowest THR = RHR + 60% (MHR - RHR)
Highest THR = RHR + 90% (MHR – RHR)
MHR = 220 – age (e.g., 220 – 40 = 180 beats/minute at age 40)

Anaerobic exercises

Anaerobic exercise: during short, fast bursts of exercise, e.g., running the 100-metre dash, more energy is required than can be provided by the oxygen taken in; a condition known as oxygen debt develops leading to shortness of breath. If the person slows or stops the exercise, recovery begins. Anaerobic exercises improve muscular strength and endurance as well as flexibility with little effect on cardiovascular endurance.

7.1.5 Other Components of Physical Fitness

Other Components of Physical Fitness

Physical fitness is the result of a blend of healthful behaviors. **Regular exercise** is only one component. other components include 1) **healthful meals**; physically fit persons need the same nutrients as inactive persons but the number of calories they need to consume to maintain ideal body weight may be different, 2) **getting the right amount of rest and sleep**; this is determined by the individual's biorhythm and is affected by factors such as activity level, regular exercise promoting healthful sleep.

Lack of sleep causes a feeling of fatigue. Stress is a major cause of insomnia; other causes include eating late, a high caffeine or sugar content in the diet, spicy food, and alcoholic beverages. Examining one's lifestyle to identify causes of stress that can be remedied, relaxation exercises, and/or a glass of milk (contains tryptophan, a natural sedative), may help combat insomnia.

Designing Your Physical Fitness Plan

7.2 Designing Your Physical Fitness Plan

Objectives:

1) Identify guidelines, principles, and lifetime sports to include in a physical fitness program.
2) Identify ways to stay healthy and safe during exercise.
3) Describe the health hazards of anabolic steroids.

Guidelines and Training Principles

7.2.1 Guidelines and Training Principles

Regular workout is important for physical fitness. To obtain maximum benefit, certain guidelines and training principles need to be known.

Guidelines

Guidelines: A medical check up is advisable before starting an exercise program. A fitness instructor will help in determining your current fitness level and in selecting suitable exercises. Knowledge about appropriate equipment and clothing, safety rules, and prevention of common injuries is important.

Training Principles

Training Principles: 1- Select exercises according to goal, e.g., flexibility or muscular endurance, (Specificity principle), **2-** Progress to higher fitness levels by increasing the body's capacity to do more work than usual (Overload principle), **3-** Gradually increase the intensity and duration of exercise (Progression principle), **4-** Exercise often enough, (3-5 times/week), to get benefits (Frequency principle), **5-** Do not start or finish strenuous exercise abruptly. Warm-up and cool-down with stretching exercises and low intensity aerobic exercises (for 3-5 minutes) to prepare joints and muscles at the beginning , and to help redistribute the blood to other body areas at the end of exercise (e.g., so that you do not faint).

Lifetimes sports

Lifetime sports: It is a good habit to cultivate sports activities that can be continued as you grow older. Swimming, walking, bicycling, and playing tennis are examples. Swimming is one of the best sports to promote cardiovascular endurance, - (if target heart rate is maintained for 20 minutes)-, muscular strength and endurance without the risk of joint injuries.

Staying Healthy and Safe During Exercise

7.2.2 Staying Healthy and Safe During Exercise

Prevention and treatment of exercise injuries: Many sports injuries could be prevented if **1-** you know your body limitations, e.g., if you are obese, a good sport would be one where your weight is not constantly supported by your legs, e.g., swimming or bicycling. Sports scientists can use physical profiling to test your limits.
2- Follow safety rules, e.g., for swimming, walk, do not run around a pool; do not dive into shallow water; know the depth of the water before swimming or diving **3-** Know common causes of exercise injuries, (poor flexibility, muscle imbalance, overtraining, poor training methods…).

The RICE treatment: is a technique for treating musculoskeletal injuries that lessen pain, limit swelling, reduce damage and promote healing. Rest (stop using the injured part until a physician tells you otherwise). Ice (place ice in an ice bag or wrap in a towel and place on the injured part). Compression (place a bandage over the ice for 30 minutes; remove both for 15 minutes, repeat for 3 hours). Elevation (above heart level so that gravity helps in reducing the swelling).

Medical treatment: should be sought for severe pain, joint problems, and infection with pus, red streaks, swollen lymph nodes or fever.

Anabolic Steroids: Anabolic steroids are synthetic derivative of the male hormone testosterone. They are taken to increase muscle bulk and strength unnaturally. However, they are dangerous to health. Taken at the onset of puberty, they stunt growth. Taken by adults, they may cause sterility and aggressiveness in males and irreversible masculine traits in females. They may also cause heart disease and liver cancer. Steroids are banned in athletic competitions**.**