



Note

12

EFFECTS OF PHYSICAL ACTIVITY

In the evening, four friends—Sukhvinder, Aslam, Mohan, and Merry—visited a nearby park for different activities along with other children. They noticed a group of children playing under the supervision of a physical instructor. The instructor invited them to join the game and informed them that if they continued to play for a longer period, they would gain many benefits from engaging in games and sports.

In the following chapter, we will discuss the benefits of physical activities. All of you likely participate in some form of physical activity in your daily lives. But have you ever thought about the effects of these physical activities? In this chapter, we will explore both the short-term and long-term effects of physical activity on the major organ systems of the human body.



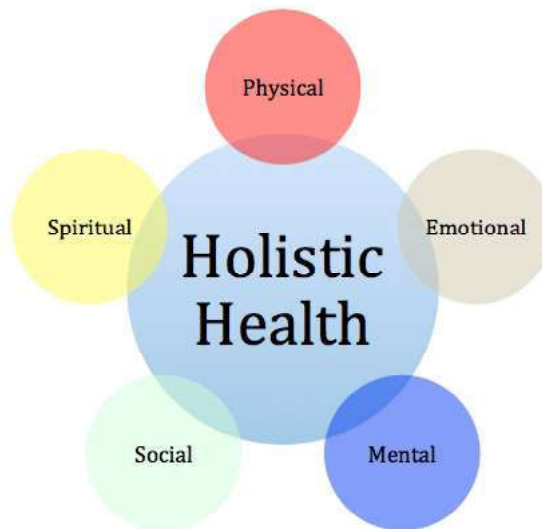
Learning Outcomes

The learner-

- describes the benefits of physical activities.
- explains the effects of games, sports and physical activities on various body systems.
- enumerates the role of Fit India Movement and Khelo India Campaign for promoting physical activities among youth.

It is well understood that healthy people have a healthy mind residing in a healthy body. When the body's various organ systems are working in harmony, such harmony is achieved. Food provides the energy required for exercise and other activities. Physical activity requires movement and coordination which is under the command of the brain, a part of the nervous system.



**Note****Activity 1**

Explain the dimensions of health in one or two lines.

Food is completely digested in the intestine which is a part of the digestive system. Through the work of the heart (a part of the circulatory system), food and oxygen reach each part of the body. Actually, the body's organ systems work in coordination to keep the body healthy. It is very important to develop and maintain physical, mental and emotional health. It is well understood that any performance at any event or sport depends not only on physical health but also on mental and emotional health.

12.1 PHYSICAL ACTIVITIES

Physical activities refer to any bodily movement that requires energy expenditure and engages the muscles. These activities range from daily and recreational activities to structured exercises and sports. Physical activities involve using the body's muscles, bones and joints leading to increased heart rate, better breathing and energy expenditure. They are classified into various categories: aerobic exercises, strength training, flexibility exercises, sports, outdoor activities, household chores, active transportation and recreational pursuits.

Regular physical activities have numerous benefits for physical health, mental well-being, and overall quality of life. They help to enhance flexibility and balance, manage weight, improve cardiovascular fitness, build strength and endurance, reduce the risk of chronic diseases, improve mood and mental health, boost cognitive function and increase energy levels. Physical activities can be tailored according to fitness levels,



health conditions and individual preferences. They play a crucial role in promoting a healthy and active lifestyle.

12.1.1 Benefits of Physical Activities

Physical activities provide numerous benefits to people across all ages. Some key benefits of engaging in physical activities are:

1. **Better Health:** Regular physical activity aids in maintaining a healthy body weight and reduces the risk of chronic diseases such as heart disease, type 2 diabetes and certain types of cancer. It strengthens muscles and bones, enhances physical fitness and improves cardiovascular health.
2. **Promotes Mental Well-being:** Physical activity boosts mental health and well-being. It reduces symptoms of depression and anxiety, boosts mood and self-esteem, and promotes better sleep. Regular exercise stimulates the release of endorphins, which are natural mood elevators and reduces stress levels.
3. **Increased Energy and Fitness:** Regular physical activity boosts energy levels and improves stamina. It enhances cardiovascular fitness, increases lung capacity, and improves muscle strength and endurance. Hence, individuals can efficiently perform daily activities with less fatigue.
4. **Weight Management:** Physical activity regulates weight management. It does so by increasing metabolism, burning calories and building lean muscle mass. Coupled with a balanced diet, regular exercise helps in weight loss, prevents weight gain and improves body composition.
5. **Improved Cognitive Function:** Physical activities positively impact brain health and cognitive function. It improves memory, attention and concentration. Regular exercise stimulates the growth of new nerve cells and blood vessels in the brain thereby improving cognitive abilities and reducing the risk of cognitive decline.
6. **Stronger Immune System:** Regular physical activity enhances the immune system, making individuals more resistant to common illnesses such as colds and flu. It improves circulation, allowing immune cells to move more efficiently throughout the body, and reduces the risk of chronic inflammation.
7. **Better Sleep:** Regular physical activity promotes better sleep patterns and quality sleep. It helps regulate sleep-wake cycles, reduces insomnia symptoms, and improves sleep duration and quality. Adequate sleep is essential for overall health and well-being.
8. **Social Interaction:** Participating in physical activities often involves social interaction, whether joining a sports team, attending group fitness classes, or exercising with



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friends and family. This promotes social connections, builds relationships, and improves overall mental and emotional well-being.

9. **Stress Reduction:** Physical activity is an effective stress management tool. Engaging in exercise helps reduce stress levels by increasing the production of endorphins, which act as natural stress relievers. It provides an outlet for releasing tension, improving mood, and promoting relaxation.
10. **Longevity and Quality of Life:** Regular physical activity has increased longevity and a higher quality of life. It helps prevent chronic diseases, improves functional abilities, and enhances overall physical and mental well-being.



Intext Question 12.1

1. Which of the following is a potential benefit of engaging in physical activities?
 - a) Improved cardiovascular health
 - b) Enhanced creativity
 - c) Reduced social interactions
 - d) Increased screen time
2. State whether True or False.

Regular physical activity helps in maintaining a healthy body weight.
3. Fill in the blank with a suitable word.

Regular physical activity promotes _____ and healthy aging.
4. Fill in the blank with a suitable word.

Regular exercise improves cardiovascular health and _____ the heart.

12.2 ORGAN SYSTEMS OF THE HUMAN BODY

Groups of cells form tissues. Different types of tissues come together to form organs, and many organs come together to form organ systems. Different organ systems perform different functions in the body that are necessary for a happy and healthy life. The organs that play important roles in the functioning of each organ, such as the heart, lungs, liver, and kidneys, are called vital organs. Before we learn about the effects of physical activity on our organ systems, let's understand how these systems work.



**Note****Organ systems for movement of the body and limbs: Skeletal and muscular systems**

When walking, playing, exercising, participating in sports, or “warming up” before exercise or competition even the most obvious movements are those of the hands and muscles. The brain works similarly. All movement is due to muscle contraction. Muscles are attached to bones. Bones make up the skeleton. Bones are connected by ligaments, and muscles are connected by tendons.

Skeletal System

This system is a combination of various bones. There are 213 bones in children and 206 in adults. These bones differ in shape and size. These bones are connected to each other by ligaments. Bones support and protect the delicate organs of our body. Some bones act as levers for our bodies. Bones also provide a surface for skeletal muscle to attach to. In fact, this system is a bone structure.

**Skeletal System****Muscular System****Muscular System**

Muscles are made up of muscle cells (also known as muscle fibers because of their elongated shape). The three types of muscles are: skeletal muscle, smooth muscle and cardiac muscle. Skeletal muscles are called voluntary extensor muscles because these muscles are consciously controlled. The smooth muscles are called involuntary muscles because they are not controlled. These muscles are found in the walls of blood vessels. Muscle features are found in hollow internal organs such as the stomach, bladder, and airways. Cardiac muscle is found in the heart. In fact, these



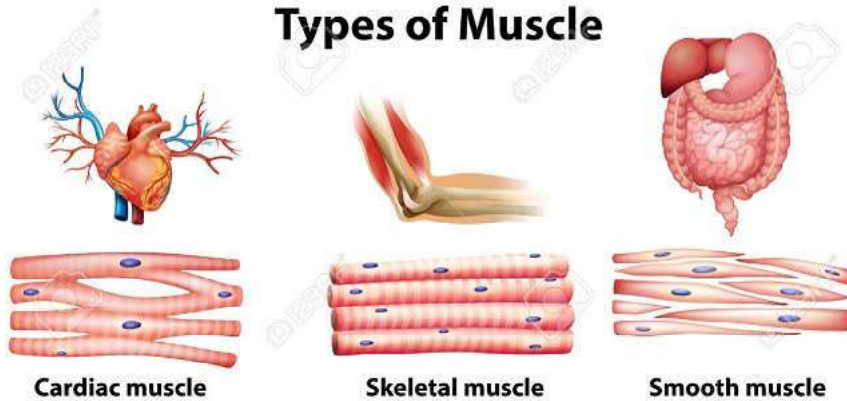


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muscles form the walls of the heart. Cardiomyocytes are striated like skeletal muscle cells but cardiac muscle is voluntary. Muscles have specific properties that help them perform different functions. Muscles are grouped together as bundles surrounded by membranes. Muscle protein molecules called *actin* and *myosin* are present in muscle fibers. Muscle movement is generated by the movement of these protein molecules.

Types of Muscle



Activity 2

Write down the number of bones in adults.

Write down the number of bones in children.



Activity 3

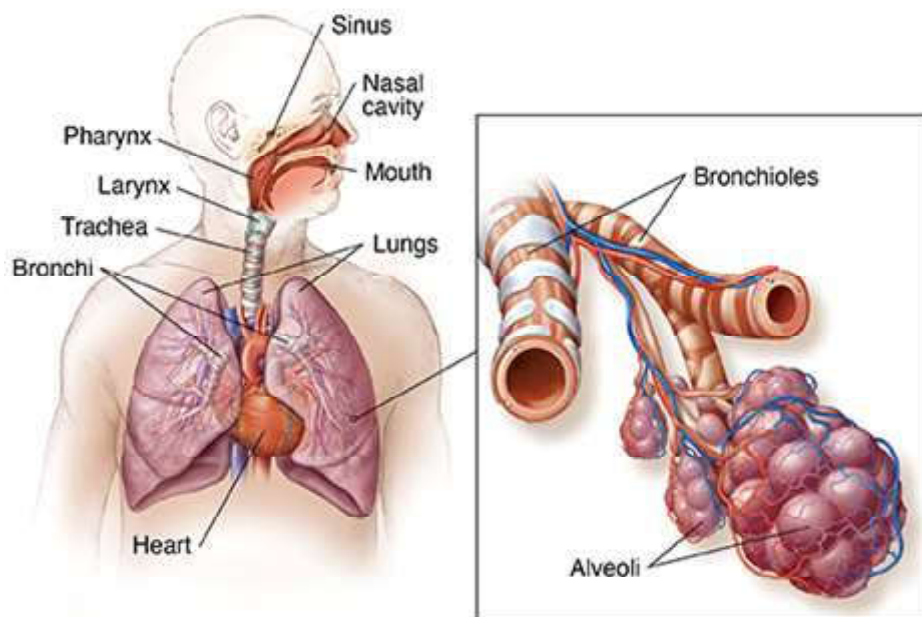
Write the names of two muscle protein.

Respiratory System

Respiration is the process of acquiring and using oxygen while expelling carbon dioxide. Humans take in oxygen from the environment and release carbon dioxide that is produced as a result of chemical changes within cells. The need for oxygen is essential for the human body.

Several chemical changes occur in tissue cells. The main product of these chemical changes is CO₂. Continuous removal of CO₂ is essential. In fact, breathing is combination *internal respiration* and *external respiration*. Breathing oxygen involves several chemical changes that produce waste products. Exhalation of waste products then occurs. The process of inhaling O₂ and exhaling CO₂ is called the respiratory process.



**Note**

12.2.1 Effects Of Physical Activity On Body Systems

Physical activities positively impact various body systems, contributing to overall health and well-being. Here are the effects of physical activities on different body systems:

1. Cardiovascular System

- 1.1 Improved heart health: Physical activities strengthen the heart muscle, promoting better blood circulation and reducing the risk of cardiovascular diseases.
- 1.2 Lower blood pressure: Regular exercise can help lower and maintain healthy levels.
- 1.3 Increased oxygen supply: Physical activities enhance lung capacity and oxygen intake, improving cardiovascular function.

2. Musculoskeletal System

- 2.1 Increased muscle strength and endurance: Physical activities, including strength training and weight-bearing exercises, stimulate muscle growth and enhance muscular strength and endurance.





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2.2 Improved bone density: Weight-bearing exercises like walking, running, and resistance training help maintain and improve bone density, reducing the risk of osteoporosis.

2.3 Enhanced joint flexibility: Regular physical activities promote joint mobility, flexibility, and strength, reducing the risk of injuries and improving overall joint health.

3. Respiratory System

3.1 Improved lung function: Physical activities, particularly aerobic exercises, strengthen the respiratory muscles and improve lung capacity, leading to better oxygen uptake and carbon dioxide removal.

3.2 Enhanced respiratory efficiency: Regular exercise can increase gas exchange efficiency in the lungs, promoting better respiratory function.

4. Immune System

4.1 Strengthened immune response: Physical activities enhance the immune system's ability to fight off infections and diseases by improving circulation, reducing inflammation, and promoting the release of immune cells and antibodies.

5. Nervous System

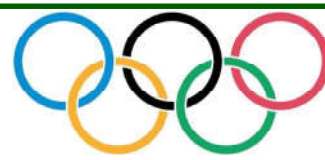
5.1 Enhanced brain function: Regular physical activities improve cognitive function, memory, and attention, and reduce the risk of cognitive decline and neurodegenerative diseases.

5.2 Mood regulation: Physical activities release endorphins, serotonin, and other neurotransmitters that help reduce stress, anxiety, and depression, promoting overall mental well-being.

6. Digestive System

6.1 Improved digestion and metabolism: Physical activities can aid in improving digestion, promoting regular bowel movements, and maintaining a healthy metabolic rate.

The benefits of physical activities vary depending on the type, intensity, duration, and frequency of the activities. It's important to consult with a healthcare professional before starting any new exercise program, especially if you have underlying health conditions or concerns.

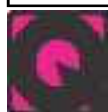


**Activity 12.4**

Enlist the benefits of prolonged physical activities on human system.

SKELETAL SYSTEM	MUSCULAR SYSTEM
1.	1.
2.	2.
3.	3.
4.	4.

CIRCULATORY SYSTEM	RESPIRATORY SYSTEM
1.	1.
2.	2.
3.	3.
4.	4.

**Intext Questions 12.2**

- State whether the following statement is True or False.
Physical activity has no effect on muscle strength, bone density and joint health.
- What are the effects of regular exercise on the brain?
 - Increased risk of cognitive decline
 - Enhanced cognitive function and improved memory
 - Decreased blood flow to the brain
 - Weakening of neural connections
- Which of the following is a benefit of regular physical activity on the cardiovascular system?
 - Increased risk of cardiovascular diseases
 - Decreased lung capacity
 - Strengthening of the heart muscle and improved blood circulation
 - Reduced flexibility in joints

**Note**

**Note****Effects of Physical Activity**

4. How does physical activity benefit the musculoskeletal system?
 - a) By reducing muscle strength and endurance
 - b) By improving bone density and joint flexibility
 - c) By decreasing respiratory efficiency
 - d) By increasing the risk of joint injuries
5. What is one positive effect of physical activity on the immune system?
 - a) Increased inflammation
 - b) Enhanced immune response and infection-fighting ability
 - c) Reduced brain function
 - d) Weakened muscle strength

12.3 KHELO INDIA CAMPAIGN

The Khelo India Campaign is an effort by the government of India to encourage sports development at the local level and find talented athletes for national and international events. The campaign, which started in 2018, aims to promote sports in India and help young people to develop their skills by giving them the necessary tools and support. The aim of Khelo India programme is to revitalise the sports culture in India mainly at the grassroots level. This initiative constructs a framework for all sports played across the nation aiming to position India as a prominent sporting nation. The following verticals are implemented by Sports Authority of India under Khelo India Campaign as given by kheloindia.gov.in

1. Khelo India State Level Centres:

At the local level, these centres offer state-of-the-art training facilities and coaching to people desirous of becoming athletes. This helps them improve their skills and possibly reach national or international levels.



2. **Annual Sports Competitions:** Khelo India Campaign conducts the Khelo India Youth Games, a national-level competition for players between the ages of 17 and 21 that includes several different sports. These events give young athletes a chance to show their abilities.
3. **Talent Search and Development:** Khelo India tries to discover and develop talented athletes by offering them scholarships, financial aid and access to good coaches, facilities and gear.



**Note**

4. **Women's Sports:** This project encourages women to play sports by setting up competitions, training programmes, and support networks to give women players more power and break down gender barriers in sports.
5. **Support to National/Regional/State Sports Academies:** Khelo India helps established sports schools with funds to improve training facilities and make the sports ecosystem better as a whole.
6. **Promotion of Sports among Persons with Disabilities:** This aims to get disabled people involved by giving them specialised coaching, facilities and opportunities to participate and do well in sports.
7. **Promotion of rural and indigenous/tribal games:** In rural and tribal areas, Khelo India helps to keep and promote traditional and indigenous sports and games. This encourages physical exercise and helps to protect our cultural heritage, too.
8. **Physical Fitness of School-going Children:** Getting kids in school to be physically fit is one of its primary aims. Khelo India emphasizes on how important it is for them to be active every day.

The Khelo India Campaign has become very famous. It helps in finding and training young athletes who are good at many sports. It has also helped to improve India's sports facilities and grow its sports ecosystem. The campaign aims to build a strong sports culture and turn out world-class athletes. This will help India fare better in international sports competitions.

12.3.1 Fit India Movement

The FIT INDIA Movement was launched on August 29, 2019, by the Honourable Prime Minister to integrate fitness into our daily existence. The objective of the Movement is to effect behavioural changes and promote a more physically active way of life. To accomplish this mission, Fit India intends to undertake several initiatives and host several events as given in Fitindia.gov.in. Its objectives are:

- To promote fitness as simple, enjoyable, and free.
- To spread awareness on fitness and various physical activities that promote fitness through focused campaigns.
- To promote indigenous sports.
- To make fitness reach every school, college/university, panchayat/village, etc.
- To establish a platform for Indian citizens to share information, raise awareness, and promote sharing personal fitness experiences.



**Note****Effects of Physical Activity**

The Ministry of Youth Affairs and Sports has promoted fitness awareness through various activities and campaigns involving multiple parties. Under the Fit India banner, the Ministry has initiated major online and offline activities in the categories of Plog Run, School Certification system, Youth Club Certification system, School Week celebrations, Cyclothon, Yoga Day, Freedom Run, Active Day series during lockdown, Champion Talks; Dialogue series; Indigenous Games series; Fit India Thematic Campaigns; and Prabhat Pheris. In addition, age-appropriate fitness protocols for various age categories have been incorporated into Fit India.

**Fit India School Week**

Fit India School Week was created in 2019 in response to the urgent need to raise fitness awareness among children, their parents, teachers and school personnel. This campaign encourages school fraternities nationwide to celebrate four to six days per week to promote a healthy and active lifestyle through various activities such as debates, quizzes, essay writing, poster-making competitions, yoga and meditation, a fitness pledge, indigenous sports, etc.

Fitness Protocols

Under the auspices of the Fit India Movement, the Ministry of Youth Affairs & Sports has developed Age-Appropriate Fitness Protocols called G.O.A.L.S. (Goals for Active Life Style) for various age groups classified as 05-18 years, 18-65 years, and 65+ years.

The Honourable Prime Minister introduced the above protocols during the “Fit India Dialogue” programme conducted on September 24, 2020 which coincided with the 1st Anniversary of the Fit India Movement. These protocols aim to improve fitness through fitness tests based on prescribed activities with various fitness components.

Role of Fit India Movement

1. **Creating Awareness:** It raises awareness about the importance of physical activities and promotes a healthy lifestyle among youth. It increases awareness about the benefits of regular exercise and leading an active lifestyle. It also talks about the risks of living a sedentary life.
2. **Fitness Assessment:** The Movement gives people fitness guidelines they can use to know how fit they are and set goals to get fitter. This test helps young people figure out how healthy they are, find areas where they can improve and keep track of their progress.



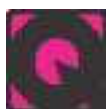
3. **Motivation and inspiration:** The Fit India Movement encourages and inspires young people to do physical activities. It shows how athletes and other people have improved their lives through exercise and encourages young people to do the same.
4. **Working with schools and colleges:** The Movement works with schools and colleges to encourage students to do more physical exercises. It encourages schools and colleges to add fitness programmes, sports and active breaks in their schedules. In this manner physical activities will become a big part of every student's life.
5. **Technological Support:** The Fit India Movement harnesses technology to facilitate fitness tracking and provide access to fitness resources. It encourages using fitness apps, wearable devices, and online tools that help young people track their activity levels, set fitness goals, and access exercise routines and nutrition advice.

The Fit India Movement received much attention and support from schools, universities, corporations, sports organisations and celebrities. It plans events and relevant awareness-raising campaigns. Various fitness-related projects are conducted nationwide to engage people to live more active and healthier lives.



Activity 12.5

Maintain a weekly fitness diary wherein you record physical activities and its duration. Prepare a report on how you feel during and after one week of the program.



Intext Questions 12.3

1. When was the Fit India Movement launched in India?
 - a) 2016
 - b) 2018
 - c) 2019
 - d) 2021
2. Who initiated the Fit India Movement?
 - a) Prime Minister Narendra Modi
 - b) President Ram Nath Kovind

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- c) Minister of Youth Affairs and Sports
 - d) Indian Olympic Association
3. How does physical exercise contribute to improving self-esteem and body image?
- a) By promoting negative body image
 - b) By reducing social interactions
 - c) By improving physical fitness and body confidence
 - d) By increasing sedentary behavior
4. What impact does engaging in physical activities have on the digestive system?
- a) Increased risk of gastrointestinal disorders
 - b) Improved digestion and bowel movement regularity
 - c) Reduced nutrient absorption
 - d) Weakening of the stomach lining
5. The Fit India Movement promotes inclusivity and encourages people of all age groups to participate in physical activities. True or False?
6. What initiatives and programs have been launched under the Fit India Movement to promote fitness and sports in India?
- a) Fit India School Certification and Fit India Active Day
 - b) Fit India Walkathon and Fit India Cyclothon
 - c) Fit India Plog Run and Fit India Freedom Run
 - d) All of the above



TERMINAL QUESTIONS

- 1. When was the Fit India Movement launched in India?
- 2. What is the primary objective of the Fit India Movement?
- 3. How does physical activity impact lung function and respiratory health?
- 4. How does physical exercise contribute to reducing stress levels and improving mood?

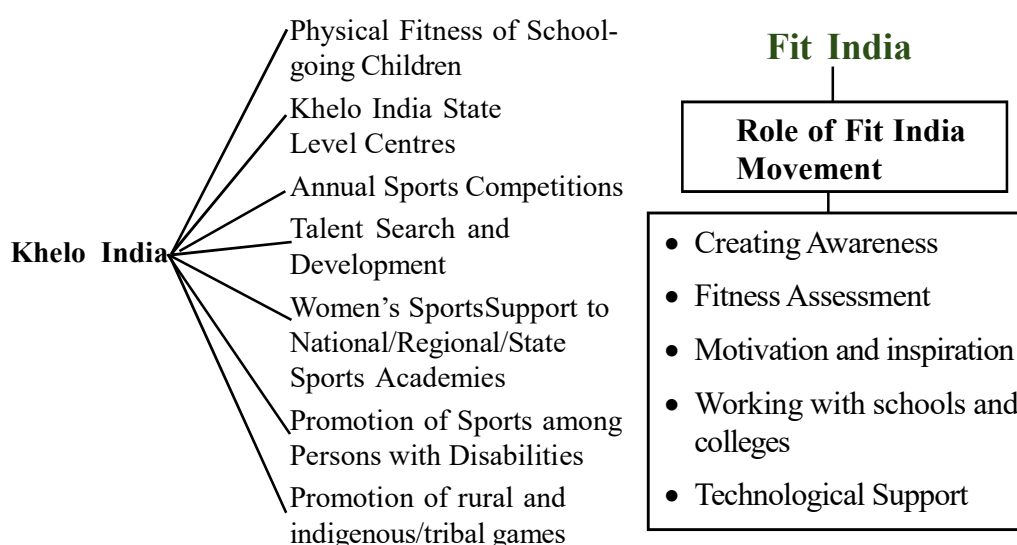
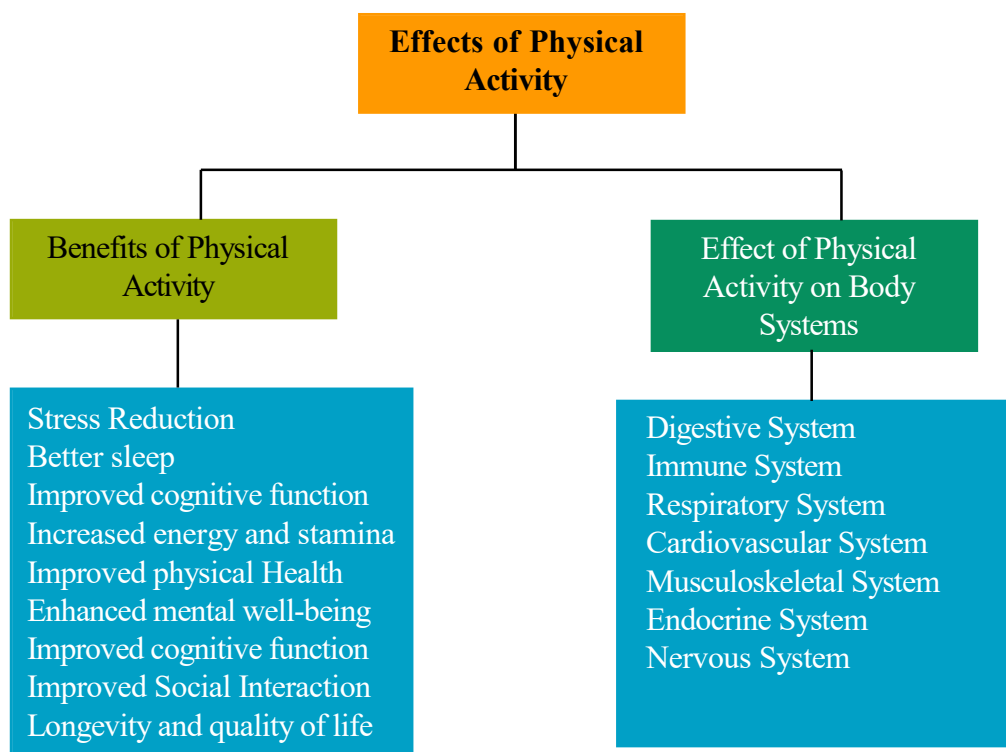




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5. How does the Fit India Movement encourage people to adopt an active and healthy lifestyle?
6. What are the key components of the Fit India Movement?
7. How does the Fit India Movement encourage people to adopt an active and healthy lifestyle?

Concept Map



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Answer to Intext Question

12.1

- 1) a) Improved cardiovascular health
- 2) True
- 3) longevity
- 4) strengthens

12.2

- 1) False
- 2) b) Enhanced cognitive function and improved memory
- 3) c) Strengthening of the heart muscle and improved blood circulation
- 4) b) By improving bone density and joint flexibility
- 5) b) Enhanced immune response and infection-fighting ability

12.3

- 1) c) 2019
- 2) a) Prime Minister Narendra Modi
- 3) c) By improving physical fitness and body confidence
- 4) b) Improved digestion and bowel movement regularity
- 5) True
- 6) d) All of the above

