

SPORTS ACTIVITIES IMPROVING CARDIORESPIRATORY FITNESS

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I. INTRODUCTION

I would like to talk about sports activities improving cardiorespiratory fitness as an important component of the physical fitness, and also I would like focus on about the benefits of these sports activities on health and well-being.

Today, everyone, from scientists to businessmen, from doctors to army officers, mention about the necessity of doing sports activities for health and well-being. Because, it promotes a happier, more fulfilling, productive life. It is certain that fitness does improve the quality of life. It is an undeniable fact that sports activities definitely improve the work performance and learning potential of the individuals.

The Armed Forces should renovate itself in accordance with today's scientific developments. The armies of tomorrow will become lighter but more complicated than ever, and entail more mental and that will need highly mobile troops. Operating complex war machines of the future will entail more mental and physical strength. The Armed Forces should take into account all scientific approaches to sports activities improving physical fitness in order to catch the world today.

All members of the Armed Forces should be aware of the importance of keeping fit and practising good health habits in accordance with their responsibilities. Your future health and well-being depends largely upon the life style you are now developing. This presentation aims to help you understand significance of sports activities improving cardiorespiratory fitness as an indispensable component of the physical fitness, and apply these concepts to your own plan for lifetime fitness.

II. DEFINING THE PHYSICAL FITNESS

Although this study is more interested in on the subject of cardiorespiratory fitness, it is necessary to start with an evaluation what « physical fitness » is.

Physical fitness has often been defined as the « ability to perform daily physical tasks energetically and, still have energy reserves to perform recreational activities and respond to emergencies requiring strength and stamina ». Fitness is not merely being well or not being sick. It is positive quality of life with quantitative graduations ranging from a vigorous and abundant life at one end of the spectrum to death at the other.

Very few individuals extend the effort to reach their maximum potentials, although many are able to reach their physical fitness levels. Many factors effect to the level of physical fitness of individuals. However the underlying principle is that the functioning of the body requires energy, which in turn depends on the ability of the hearth, lungs and blood vessels to process oxygen and deliver it to the muscles where it becomes the fuel for energy. It can pump more blood each time it contracts. It can circulate more blood during maximal work and it does not have to work as hard during rest or during submaximal work.

The body will be capable of processing and using greater amounts of oxygen as a result of physical fitness activities, because the intake and supply channels become more efficient. The field of physical fitness is not merely related with sport activities , these activities are closely connected with

all everyday life activities. It can be argued that a person who does not exercise regularly may lack sufficient energy to perform simple everyday tasks such as sitting, standing and walking. This is because the body functions insufficiently and, is therefore forced to « overwork » to provide the energy necessary for the performance of these tasks. A person who exercises regularly will have an extra energy reserve because of the increase in efficiency of the functioning of the body. Not surprisingly, this person will have more drive, increased energy, will feel good, and possibly will be more productive.

III. COMPONENTS OF THE PHYSICAL FITNESS

There has been a contradiction in terms as to what actually are the components of physical fitness. In order to clarify this contradictory situation, I will try to classify existing components of the physical fitness into two categories.

1. Health-Related Physical Fitness
2. Skill-Related Physical Fitness

A) Health -Related Physical Fitness Components:

It is now generally agreed that only these components related to the development of health and that increase the functional capacity of the body will be classified as the health-related physical fitness components. These are:

- a) Cardiovascular Endurance
- b) Flexibility
- c) Strength
- d) Muscular Endurance
- e) Body Composition

B) Skill-Related Physical Fitness Components:

These are several essential components for the successful execution of various sports skills. These are often referred to as « skill-related » or « performance related ». These are agility, balance, co-ordination, speed, power and reaction time.

IV. PHYSICAL FITNESS, HEALTH AND WELLNESS

Health is generally accepted as absence of disease. Health should not be considered as simply absence of disease. We must understand the health as complete physical, mental and emotional well-being. Health concept should be evaluated within the context of improving physical and mental capacity of human beings.

A term that is often used to describe a high level of health is wellness. It is defined as a positive approach to health where each person accepts the responsibility for his/her life -style makes decisions. Accordingly, as he/she continually strives for a high-level of physical well-being.

We can positively influence our level of health by the decisions we make. To be the most successful it is important to do the following.:

- Exercise regularly
- Eat sensibly
- Eliminate smoking

- Control body weight
- Manage stress
- Limit alcohol consumption
- Avoid drug abuse
- Adopt sensible safety habits.

Everyday exercises are important of the physical fitness and there are many advantages of the development of the development of the optimum level of physical fitness. These advantages of exercises can be classified as follows:

- Feeling better and having more energy
- Reducing level of the stress and tension
- More productivity in their everyday tasks
- Enjoying life more
- Psychological benefits like as self-confidence.

As have been stated earlier, sports activities improve the work performance of the individuals by improving physical and mental capacity of them. Sports activities improving cardiorespiratory fitness is a basic component of the health-related physical fitness. It helps us by developing our physical and mental capacity for realising our everyday tasks., and also military tasks of the Armed Forces. However, our health and wellness are closely connected with cardiorespiratory fitness.

V. CARDIORESPIRATORY FITNESS

Cardiorespiratory fitness is considered by most physical fitness experts to be the most important component of physical fitness. Cardiorespiratory fitness refers to the efficiency of the body in transporting and utilising oxygen.

These two organs associated with the intake, delivery and utilisation of oxygen are the heart and lungs- hence the term cardio (heart) and respiratory (breathing). Oxygen is the catalyst that initiates the burning of calories to produce energy, a process known as oxidation. During the exercise, an increase in energy expenditure calls for a similar increase in the amount of oxygen required for oxidation to take place.

When your cardiorespiratory system cannot meet the increased demand for oxygen during heightened physical activity, the intensity of the activity must be reduced in order to strike a balance between the amount of oxygen required and the amount that can be delivered.

Since you live an environment in which the supply of oxygen is unlimited, the problem of obtaining enough oxygen is not an external one, but rather an internal one. The ability of the cardiorespiratory system to process oxygen can be severely limited in some unconditioned people that even slight increases in energy demands, like climbing a flight of stairs, can cause both heart and respiration rates to rise significantly.

A. TRAINING GUIDELINES FOR CARDIORESPIRATORY FITNESS

Certain factors concerning the quality and quantity of the training should be considered in development and maintenance of cardiorespiratory fitness. These include the type, intensity and duration of exercise. In addition, physical limitations should be increased.

Type of exercise: Cardiorespiratory fitness can be attained by participation in a training programme in which the activities are rhythmic in nature, sustained for a period of time and involve large muscle

groups. These activities include aerobics, jogging, running, cycling, rowing, speed skating,, skipping, ultimate frisbee and many other sustained movement activities.

You should choose enjoyable, but vigorous activities that provide a training stimulus. Using a variety of activities in a programme tends to reduce injuries caused from overuse, relieve boredom and produce overall fitness.

Intensity: For health young adults the heart rate is a good indicator of the intensity of the activity. Scientific researches recommend the intensity of the activity should be vigorous enough to increase the heart rate from 60% to 90% of the maximum heart rate reserve. This range is referred as the target heart rate. Maximum heart rate reserve represents the percentage of difference between the resting heart rate and the maximum heart rate added to resting rate.

Target heart rate lower limit: $60\% (\text{MHR}-\text{RHR}) + \text{RHR}$

Target heart rate upper limit: $90\% (\text{MHR}-\text{RHR}) + \text{RHR}$

You should train near the lower limit of target heart rate zone when beginning a programme. Exercise does not have to be unbearable/painful for a reasonable level of cardiorespiratory fitness to be obtained. Training at the lower limit of target heart rate zone represents moderately intense activity that can be continued also for an extended period of time with little discomfort. Once the benefits of training begin to occur, the training intensity can be safely increased to higher levels within the target heart rate zone.

Duration (Time): The training session should be 15 to 60 minutes of continuous aerobic activity with 20 to 30 minutes being a reasonable goal. For the greatest gains per unit of time of exercise, thirty minutes appears to be the best. Generally, the greater the intensity, the shorter the duration and vice versa;

Frequency: In order to achieve and maintain cardiorespiratory fitness, you must exercise on a regular basis. Generally, a training three to five days per week is recommended. Training less than three days a week appears to be inadequate for gains in cardiorespiratory fitness, while training more than five days a week results in greater incidence of injury. After a desired level of fitness has been reached, it is possible to maintain close to that level by training twice a week. Upon cessation of a training programme, a significant reduction in working capacity begins to occur after two weeks.

Precautions: Before beginning a training session, warm up with static stretching exercises for the muscle groups and joints involved in the workout. Begin the exercise slowly and increase the pace until the target heart rate is reached. Monitor the heart rate periodically to determine if the pace is too fast or slow. After a few training sessions, you will be able to 'feel' when the target heart rate is reached. Perform the activities with proper form and technique to reduce the chance of injury and needless fatigue.

Do not overtrain! Initially, the training progression should be slow.

If deconditioned and just beginning a programme, train every other day. Let the body have time it needs for recovery by alternating hard and easy days. After the muscles and tendons have toughened and become accustomed to the training routine, the progression can be increased. Remember, using a variety of activities helps prevent injuries from overuse.

Do not attempt to exercise through persistent pain. If a localised pain increases during exercise, the workout should be discontinued. If you experience shortness of breath, dizziness, pain, chest or nausea, the exercise should be terminated and a physician should be consulted.

Monitor the heart determine the recovery rate during the first couple of minutes after completion of exercise. The rate of recovery will be faster as your fitness level improves. Cool down slowly and stretch at the end of the workout. The muscles are the warmest at this time and significant improvement in flexibility can be made. The antagonistic (opposing) muscle groups should be strengthened by doing resistance exercises to prevent muscular imbalances from occurring.

B. TRAINING EFFECTS OF CARDIORESPIRATORY FITNESS PROGRAMME

When the body receives a cardiorespiratory training stimulus on a regular basis, physiological changes begin to occur. The heart enlarges, becomes stronger, and is more efficient. The stroke volume, the amount of blood pumped out of the left ventricle with each beat increases. Resting pulse decreases as does the pulse rate for any given submaximal workload. Increased capillarization around the cells improves the oxygen diffusion at the cellular level. These enhances the process of replenishing the cells with nutrients and removing metabolic wastes. Also the collateral circulation feeding the heart is improved. This increases your chances of surviving a heart attack by providing alternate pathways of blood vessels around the blocked artery.

In addition, training enables arteries to better maintain their elasticity, which enables them to accommodate the great pressures. Likewise, the number of blood cells increases, which provides haemoglobin for transporting oxygen to the cells. Training also reduces low density lipoproteins and increases high density lipoproteins, providing an increased protection against coronary heart disease.

C. CARDIORESPIRATORY ACTIVITIES

Cardiorespiratory activities are those activities that are rhythmic in nature, can be sustained for a long period of time, and use large muscle groups in the body. IN order to provide a cardiorespiratory training stimulus, these activities must meet the requirements in terms of intensity, duration and frequency as was mentioned before.

JOGGING AND RUNNING These activities have become extremely popular in the last fifteen years. They provide an excellent training stimulus for cardiorespiratory gains and are easy to control in regard to intensity, frequency and duration of the exercise. Jogging and running require little equipment and give the individual a sense of freedom.

The disadvantages of jogging and running are the high incidence of injuries associated with these activities. Injuries occur for many reasons, including the weigh bearing nature of the activities, poor anatomical structure in some individuals, abuse of a proper training progression, and overuse. Common injuries include tendinitis, shin soreness or shin splints, blisters, stress fractures, foot and knee sprains, jogger's nipple and toe, muscle injuries and strains, chondromalacia patellae and dehydration. The majority of these injuries could be avoided by proper foot support and clothing adequate warm up and, cool down, slow training progression, and staying within limitations of your anatomical structure. Research indicates that it is not necessary to run more than three miles five times a week in order to reach a reasonable level of cardiorespiratory fitness. If you run more than this, you are probably running for a reason other than general cardiorespiratory fitness.

CYCLING The number of cyclists has generally increased during the last decade. This trend appears to be partly the result of the increasing popularity of triathlons coupled with the high incidence of running and jogging injuries. Cycling is enjoyable and allows you to tour countryside while receiving an excellent cardiorespiratory training stimulus.

SWIMMING Swimming is a non-weight bearing cardiorespiratory activity that is excellent when used either as a programme in itself or to supplement other activities. Swimming provides a total workout using the resistance of water. Swimming may be used to maintain cardiorespiratory fitness when resting from a hard workout in another activity or recuperating from injury. Due to the non-weight bearing, and aquatic nature of the activity, swimming offers four advantages over most other activities.

First, the cooling effect of the water helps maintain body temperature closer to normal during exercise.

Secondly, since swimming is a non-weight bearing activity, there is a less trauma, to the joints.

The third advantage involves the therapeutic nature of the water, in general and in treatment of injuries. In water, you are able to exercise through a full range of motion with minimal resistance with the buoyancy of the water providing support for the injured limb.

GAMES Game-type activities are very enjoyable activities and, will maintain or improve your cardiorespiratory fitness level of intensity. Duration and frequency are sufficient to provide a training stimulus. However when opponents are not of equal ability, it is sometimes difficult for both or all to receive a training stimulus. If you use recreational games for a training programme, the training stimulus must be provided in regard to intensity, duration and frequency.

D. INTERVAL TRAINING

Slow continuous activity is used to build an aerobic base in a cardiorespiratory training programme. The use of these activities permits physiological changes in the body to occur with little chance of injury. In addition, low intensity, long duration exercise produces less soreness in the working muscles than the high intensity short duration exercise.

As your fitness level improves, the desire for competition may increase. The focus of the training programme then shifts from maintaining cardiorespiratory fitness to improving the performance. A popular method of training to increase your speed is called interval training. The following factors are controlled in interval training distance of the interval, time of the interval type of recovery between intervals, amount of recovery between intervals, and the number of the intervals. You should adjust your interval training to meet your needs. Interval training is used a couple of times per week by most athletes. Remember to alternate hard and easy workout days. Interval training is a vital method of training for you when competing in speed and endurance events.

Upon the cessation of exercise the hearth rate falls, permitting more time for the blood to fill the heart. These results in a strong expansion stimulus being exerted on the hearth, which in turn increases stroke volume. Since interval training consists of repeated periods of intense activity interspersed with the recovery periods, the repeated attainment of the peak stroke volumes stimulates the oxygen transport system of the body more than standard training methods, in which the only the recovery period may occur at the end of the workout. Therefore, it is generally agreed that stroke volume is best improved through the use of interval training.

E. FARTLEK TRAINING

In fartlek training, another type of cardiorespiratory training sometimes called speed play, the soldier varies the intensity (speed) of the running during the workout. Instead of running at a constant speed, he starts with very slow jogging. When ready, he runs hard for few minutes until he feels the need to slow down. At this time he recovers by jogging at an easy pace. This process of alternating fast and recover running (both of varying distances) gives the same result as interval training. However

neither the running nor recovery interval is times and the running is not done on a track. For these reasons many runners prefer fartlek training to interval training.

VI. CONCLUSION

In the developing world, all scientific researchers point out the significance of everyday sports activities improving the physical fitness for providing physical and mental strength. Sports activities improving physical fitness also positively influence the health and well-being of individuals. Sports activities improving the cardiorespiratory fitness is the basic component of health-related physical fitness activities that help us realise energetically everyday task of individuals.

Today everyone agrees that, all individuals need to do sport activities for physical, mental and emotional fitness. Sports activities improving the cardiorespiratory fitness should be indispensable element of the all physical educating programmes including military ones and, it should renovate itself in accordance with contemporary scientific developments. In this study, I tried to throw light on significance of sport activities firstly. Basic sports activities improving cardiorespiratory fitness and, the certain factors that should be taken into account in training programmes are tried to be indicated, then.

Finally, it is obvious that sports activities improving physical, mental and emotional fitness of the individuals are integral part of military education and health programmes and realising military objectives that need highly motivated and mobile troops.
