Assessment of Physical activity with their effect on human circulatory system

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Abstract
Physical activity has been shown to have beneficial effects on glucose metabolism, skeletal muscle function, ventilator muscle strength, bone stability, locomotors coordination, psychological well-being, and other organ functions. However, in the context of this review, we will focus entirely on important molecular effects on the cardiovascular system. The aim of this review is to provide a bird's-eye view on what is known and unknown about the physiological and biochemical mechanisms involved in mediating exercise-induced cardiovascular effects. The resulting map is surprisingly detailed in some areas (ie, endothelial function), whereas other areas, such as direct cardiac training effects in heart failure, are still incompletely understood. For practical purposes, we have decided to use primarily an anatomic approach to present key data on exercise effects on cardiac and vascular function. For the cardiac effects, the left ventricle and the cardiac valves will be described separately; for the vascular effects, we will follow the arterial vascular tree, addressing changes in the aorta, the large conduit arteries, the resistance vessels, and the microcirculation before turning our attention toward the venous and the pulmonary circulation.

Key words: skeletal muscle function, ventilator muscle strength, bone stability, locomotors coordination.

INTRODUCTION

In the natural habitat of our ancestors, physical activity was not a preventive intervention but a matter of survival. In this hostile environment with scarce food and ubiquitous dangers, human genes were selected to optimize aerobic metabolic pathways and conserve energy for potential future famines.1 Cardiac and vascular functions were continuously challenged by intermittent bouts of high-intensity physical activity and adapted to meet the metabolic demands of the working skeletal muscle under these conditions. When speaking about molecular cardiovascular effects of exercise, we should keep in mind that most of the changes from baseline are probably a return to normal values. The statistical average of physical activity in Western societies is so much below the levels normal for our genetic background that sedentary lifestyle in combination with excess food intake has surpassed smoking as the No. 1 preventable cause of death in the United States 2.

The purpose of this section is to explore various changes in circulatory system of the body with respect to the physiological mechanism involved as well as to the relevant training factor. The teachers of physical education, coaches, sports, persons and students of physical education must be aware about the effect of physical exercises training on various systems to realize the qualitative changes in the body for better performance. Our body has many systems. Cardiovascular System is one of them which plays an important role in our body. Cardiovascular system is a systematic series of vessels that transport blood to the tissues from the heart & back to the heart. The heart is a wondrous pump, which powers the human body. With each heartbeat, it sends life-giving blood throughout the body. Blood carries oxygen and flood to all the body cells. The heart is a large, hollow, muscular organ divided into two pumps that lie side by side. Veins transport blood from throughout the body to the right – sided pump. That pump sends the blood to the lungs, where it picks up oxygen. The oxygenated blood then flows to the left side of the heart, which is pumped through arteries to the rest of the body. Valves control the flow of blood through the heart. The left-sided pump, which delivers blood throughout the body, is larger and stronger than the right pump.

The American College of Cardiology/American Heart Association recommends at least 30 minutes of moderate (at50–70% of maximal predicted heart rate) exercise on most days to reduce the risk of cardiovascular events [1]. Several human studies clearly demonstrate that chronic aerobic exercise regimens improve cardiovascular function. This is true not only in healthy subjects without any underlying risk factors [2], but also in older people [3], and those with cardiovascular risk factors [4]. Indeed, those with cardiovascular risk factor/disease will benefit more. There is a much higher consistency in the results of studies which assess participants with cardiovascular disease/risk factors compared to healthy subjects. Patients with hypertension [5], type 2 diabetes [6], metabolic syndrome [7], stable cardiovascular disease [8], myocardial infarction [9], and congestive heart failure [10], all benefit from exercise training compared to those who do not participate in any training. Importantly, an exercise regimen that improves endothelial function in diabetic patients fails to benefit healthy subjects [6, 11]. In healthy individuals, a longer and more intense exercise protocol is needed to induce measureable changes in cardiovascular parameters, while older and sicker subjects can benefit from less intense exercise regimens. Treatment and control of established known cardiovascular risk factors includes the reduction of hyper cholesterol anemia, hypertension, and smoking [12].

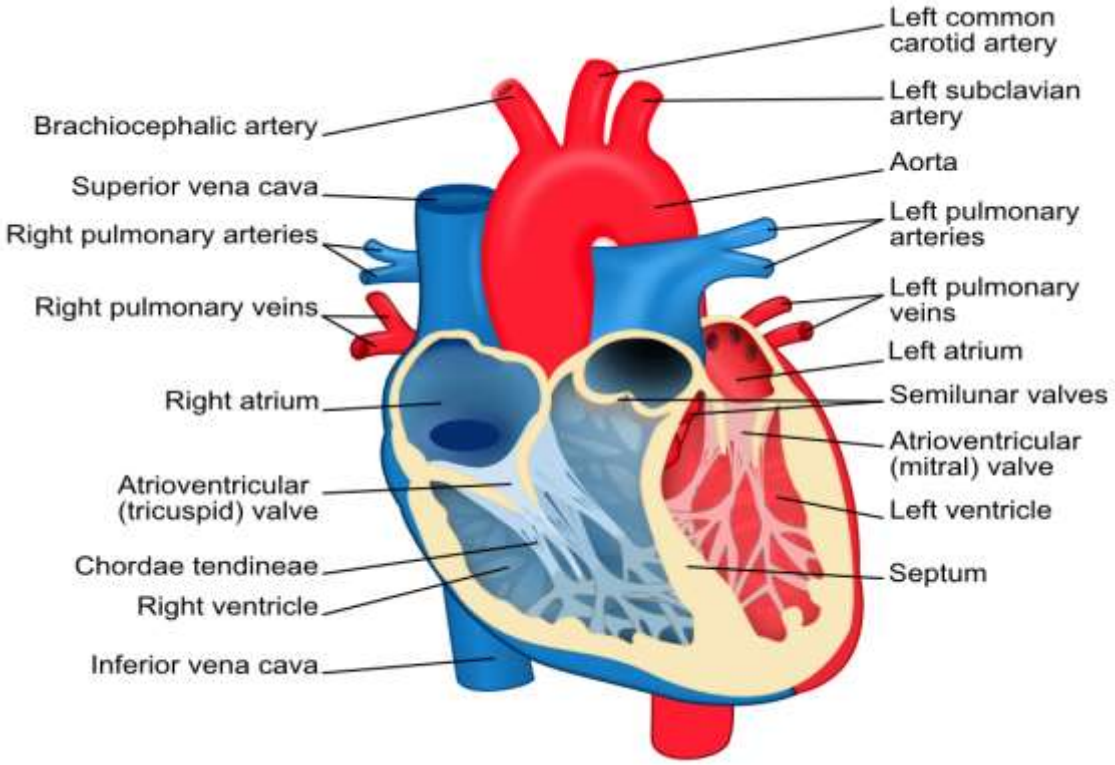

Figure 1.1Circulatory System (heart)

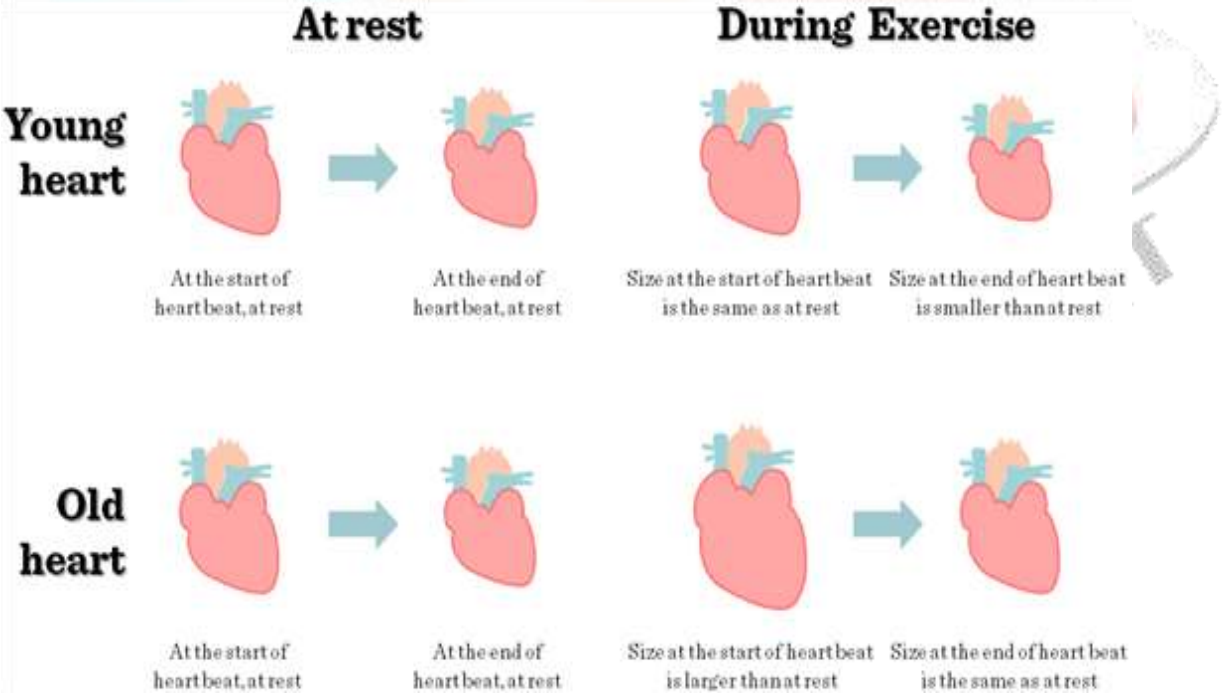

Figure1.2 heart during rest and after exercise.

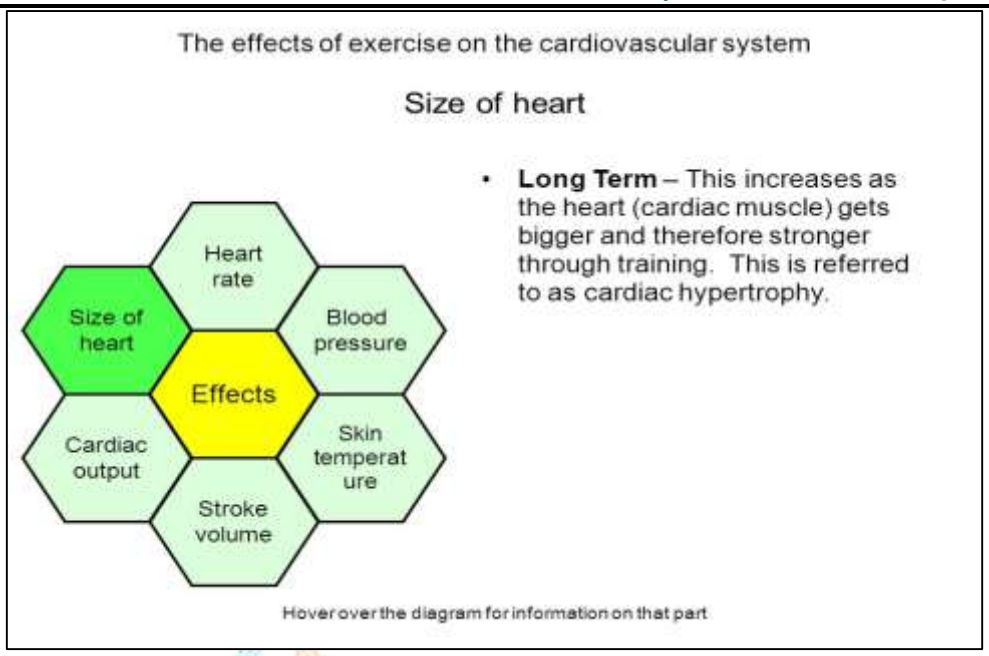

Figure 1.3 Effect of exercise on circulatory system

During the past decade, the mortality rates from coronary heart disease and stroke in the United States were reduced by more than 25%.However, the prevalence of diabetes mellitus has increased steadily, mostly because of an epidemic of adiposity [13].This unfortunate change can mitigate further improvements in cardiovascular mortality and can potentially reverse the decline in cardiovascular disease incidence that has been achieved through decades of education, improved healthcare, and better lifestyle choices. Prevention can be categorized into three components. Primary prevention is concerned with health promotion activities, which prevent the actual occurrence of a specific illness or disease. Secondary prevention promotes early detection or screening and treatment of disease and limitation of disability. This level of prevention is also called health maintenance. Tertiary prevention is directed at recovery or rehabilitation of a disease or conditions after the disease2 Cardiology Research and Practice has developed. Physical activity, as one the most important components of cardiovascular disease prevention, has crucial roles at all three levels. Despite the strong evidence link in physical activity to cardiovascular disease risk reduction, there remains much uncertainty regarding the underlying mechanisms. In this paper, we discuss the benefits of exercises a modifiable lifestyle parameter and its relation to cardiovascular health at molecular level. We will discuss recent findings related to the cardiovascular benefits of exercise and also survey the clinical evidence for exercise-induced cardiovascular improvement.**Cardiac Effects of Exercise**

Free radicals, which are a subset of reactive oxygen species (ROS), are physiological by products of aerobic metabolism [14] and are widely recognized for their dual roles as both deleterious and beneficial species, since they can be either harmful or beneficial to living systems [15]. High concentrations of free radical sharm living organisms through reactions with adjacent molecules such as proteins, lipids, carbohydrates, and nucleic acids. As a result, mammalian cells have evolved a variety of antioxidant mechanisms to control ROS production and propagation [16]. On the other hand, mild oxidative stress can act as a stimulant of physiological antioxidant systems and as a trigger for various physiological adaptations [17].This has led to our current understanding of free radical mediated effects of exercise as a phenomenon of hormesis [18], according to which there may be a bell-shaped curve of oxidative stress in response to exercise, with none and excessive exercise being considered harmful and moderate levels being of most beneficial [19, 20]. Regular physical exercise delays the accumulation of ROS-mediated cell damage by improving the anti oxidative protective mechanisms in the myocardium. The strongest evidence to directly link increases in myocardial antioxidants and exercise induced cardioprotection implicates a contributory role for manganese superoxide dismutase (MnSOD). It is generally believed that even short-term endurance exercise results in a rapid increase in myocardial Mn SOD activity [21–23], as shown in studies using antisense oligo nucleotide techniquesto silence Mn SOD genes and so prevent exercise-induced increases in myocardial Mn SOD activity [22, 24]. Yamashitaetal. [22] reported that inhibition of exercise-induced increases in cardiac Mn SOD abolished protection against myocardial infarction, findings that were confirmed by Hamilton et al. [25] who concluded that Mn SOD plays a key role against ischemia-reperfusion-(I/R-) induced cardiac arrhythmias.

Resting Heart Rate Chart For Men

Age	Athletes	Excellent	Good	Above Ave.	Ave.	Below Ave.	Poor
18-25	49-55	56-61	62-65	66-69	70-73	74-81	82+
26-35	49-54	55-61	62-65	66-70	71-74	75-81	82+
36-45	50-56	57-62	63-66	67-70	71-75	76-82	83+
46-55	50-57	58-63	64-67	68-71	72-76	77-83	84+
56-65	51-56	57-61	62-67	68-71	72-75	76-81	82+
65+	50-55	56-61	62-65	66-69	70-73	74-79	80+

Resting Heart Rate Chart For Women

Age	Athletes	Excellent	Good	Above Ave.	Ave.	Below Ave.	Poor
18-25	54-60	61-65	66-69	70-73	74-78	79-84	85+
26-35	54-59	60-64	65-68	69-72	73-76	77-82	83+
36-45	54-59	60-64	65-69	70-73	74-78	79-84	85+
46-55	54-60	61-65	66-69	70-73	74-77	78-83	84+
56-65	54-59	60-64	65-68	69-73	74-77	78-83	84+
65+	54-59	60-64	65-68	69-72	73-76	77-84	84+

Table 1.1 Resting heart rate of men and women

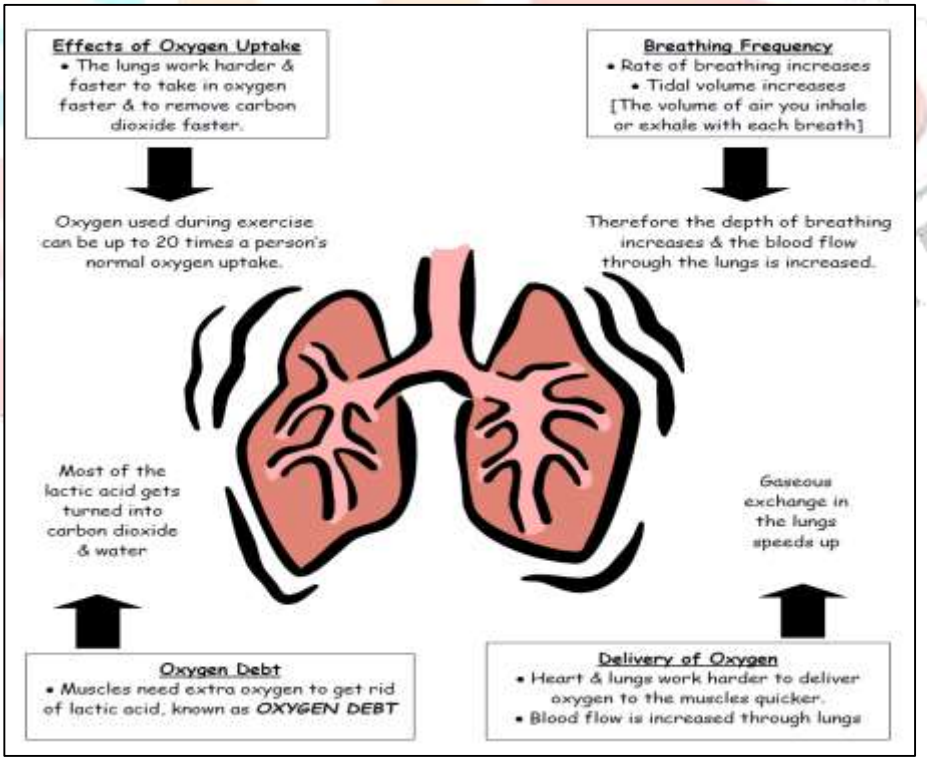

Figure 1.5 Cardio-respiratory Responses to Exercises

MATERIAL AND METHODS

To find out the percentage of among football, cricket, and athletics player; to check out the nature of effect of exercise on circulatory system for physical strength.

Research Methodology

The methodology that was used to carry out this study is defined as an operational framework within which the facts are placed so that their meaning may be seen more clearly. The task that follows the definition of the research problem is the preparation of the design. The methodology of this research includes the research design, population to be studied and sampling strategy, the data collection process, the instruments used for gathering data, and how data was analyzed and presented. A quantitative cross-sectional study design was chosen to accomplish the objectives of the study. Fifteen subjects were selected through convenience sampling procedure from Barkatullah university ground Bhopal by sing a structural introduction to collect the information. **R**esearch is based on researcher's personal observation & critical thinking after the observation of several international books & concern Wikipedia related with cardio vascular fitness & exercises.

Study Design

The purpose of the study was to find out to explore various changes in circulatory system of the body with respect to the physiological mechanism involved as well as to the relevant training factor. The teachers of physical education, coaches, sports, persons and students of physical education must be aware about the effect of physical exercises training on various systems to realize the qualitative changes in the body for better performance.

Our body has many systems. Cardiovascular System is one of them which plays an important role in our body. Cardiovascular system is a systematic series of vessels that transport blood to the tissues from the heart & back to the heart. A cross sectional prospective survey design is chosen because data were collect from samples at one point of time and the questions are asked retrospectively on events, sites and feelings (Bowling, 1998). Survey researches describe parameters of population and predict relationship among these characteristics (Depoy&Gitlin, 1998). The goals of the quantitative research are to answer a specific research question by showing statistical evidence that the data may be addressed in a particular way (Bailey, 1997). A survey is a research which involves collecting information from a large number of people using interviews, in order that an overall picture of that group can be described in terms of any characteristics which are interest to the research (Hicks, 1999). The advantages of survey design are that one can reach a large number of respondents with relatively minimal expenditure, numerous variables can be measured by a single instrument, and statistical manipulation during the data analytical phase can permit multiple use of the data set (Depoy&Gitlin, 1998). The most common survey approach is the prospective design which focuses particularly on present events (Hicks, 1999). So, for conducting of this study a cross sectional prospective survey approach was used.

Study site

Bhopal is the capital of Madhya Pradesh situated in central part of India. Barkatullah University situated in Bhopal .

Sample selection

Samples were selected by convenience sampling technique, easily to find out the data for my study purpose.

Data collection

Data collection is one of the most crucial parts of research. For this study data collection includes- method of data collection-, materials used for data collection, duration and procedure of data collection.

Duration of data collection

The duration of data collection was 5th January to10 June. To collect data necessary time was taken, for each participant. It was taken 20-30 minute to complete each interview.

Data analysis

Data was analyzed using descriptive and inferential statistics. This enabled the researcher to make possible predictions about the study. The descriptive statistical tools helped the researcher to describe the data and determine the extent to be used. The findings were presented using tables and charts. Data analysis used and Microsoft excels, percentages, tabulations, means. Tables were used to summarize responses for further analysis and facilitate comparison. This generated quantitative reports through tabulations, percentages, and measure of central tendency. Notes that the use of percentages is important for two reasons; first they simplify data by reducing all the numbers to range between 0 and 100. Second, they translate the data into standard form with a base of 100 for relative comparisons.

Inform consent

The aims and objectives of this study should be informed to the subjects verbally. Before conducting research with the respondents, it is necessary to gain consent from the subjects (Bailey, 1997). The consent form was given to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any times. It should be assured the participant that her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participant will also be informed or given notice that the research result would not be harmful for them. It would be kept confidential. Every participant has the right to discuss about her problem with senior authority.

Blood supply to organ	Rest	Extreme Exercise
Digestive track	20-25%	4-5%
Cardiac muscle	4-5%	4-5%
Kidneys	20%	3-4%
Bones	3-5%	0.4-1%
Brain	15%	3-4%
Skin	4-5%	6-20%
Skeletal Muscle	15-20%	65-85%

Note: This table is based on personal view of researcher by observation of several books.

Blood Pressure Chart

Top number (systolic) in mm Hg		Bottom number (diastolic) in mm Hg	Your category*	What to do**
Below 120	and	Below 80	Normal blood pressure	Maintain or adopt a healthy lifestyle.
120-139	or	80-89	Pre-Hypertension	Maintain or adopt a healthy lifestyle.
140-159	or	90-99	Stage 1 Hypertension	Maintain or adopt a healthy lifestyle. If blood pressure goal isn't reached in about six months, talk to your doctor about taking one or more medications.
160 or more	or	100 or more	Stage 2 Hypertension	Maintain or adopt a healthy lifestyle. Talk to your doctor about taking more than one medication.

Result and Discussion

The benefits of regular exercise include more then just having a well-toned body. Beside surving as a mood intensifier, physical activity has both long term and short term effect on the cardio vascular system. Good blood circulation through out your body may provide long term standing positive effect to our health. Body gives temperature when work out is for 30 min. at least 5 day in a week may help mitigat a chance of developing many heart related diseases.

Effect of exercise on circulatory system is recognized by evaluating the pulse rate of person in normal condition and after the exercise: 1000mt running, shuttle run, and yoga. After taken the pulse rate of 20 people of cricket, athletics, and football player of Barkatullah University the following changes were observed shown in table 4.1.

Before the person starts exercise, the body go through an anticipative response during this response the body will release adrenaline consistently before the person sweat. The adrenaline facilitates cardio respiratory activity, carbohydrate and fat metabolism. In table 4.1 found the pulse rate against the normal range lies 70% has been under the reference range, 30% pulse rate has been above the normal range. The % SPO_2 against the normal range lies 10% has been under the reference range, 90% - %SPO_2has been above the normal range. As per the physical strength of a sports person is normal in given study.

Table 4.1 To observed the pulse rate after 1000mt race

S.No.	Value observed		Reference range	
	Pulse rate	% SPO_2	Pulse rate	% SPO_2
1	142	97	60 to 100 beats/min	94% to 99%
2	98	115	60 to 100 beats/min	94% to 99%
3	99	113	60 to 100 beats/min	94% to 99%
4	99	152	60 to 100 beats/min	94% to 99%
5	98	139	60 to 100 beats/min	94% to 99%
6	99	104	60 to 100 beats/min	94% to 99%
7	98	118	60 to 100 beats/min	94% to 99%
8	98	126	60 to 100 beats/min	94% to 99%
9	99	145	60 to 100 beats/min	94% to 99%
10	98	128	60 to 100 beats/min	94% to 99%
11	97	124	60 to 100 beats/min	94% to 99%
12	97	132	60 to 100 beats/min	94% to 99%
13	99	154	60 to 100 beats/min	94% to 99%
14	150	97	60 to 100 beats/min	94% to 99%
15	120	99	60 to 100 beats/min	94% to 99%

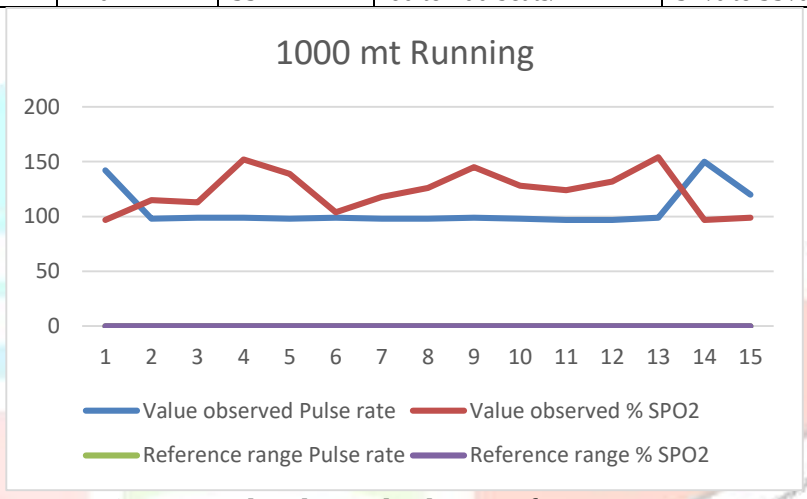

Figure 4.1 value observed pulse rate after 1000mt run

Table 4.2 To observed the pulse rate after shuttle run

S.NO.	VALUE OBSERVED		REFERENCE RANGE	
	% SPO_2	Pulse rate	% SPO_2	Pulse rate
1	176	97	94% to 99%	60 to 100 beats/minute
2	131	93	94% to 99%	60 to 100 beats/minute
3	180	94	94% to 99%	60 to 100 beats/minute
4	186	97	94% to 99%	60 to 100 beats/minute
5	172	97	94% to 99%	60 to 100 beats/minute
6	168	97	94% to 99%	60 to 100 beats/minute
7	153	97	94% to 99%	60 to 100 beats/minute
8	153	98	94% to 99%	60 to 100 beats/minute
9	158	94	94% to 99%	60 to 100 beats/minute
10	180	99	94% to 99%	60 to 100 beats/minute
11	177	97	94% to 99%	60 to 100 beats/minute
12	160	97	94% to 99%	60 to 100 beats/minute
13	147	97	94% to 99%	60 to 100 beats/minute
14	167	92	94% to 99%	60 to 100 beats/minute
15	179	79	94% to 99%	60 to 100 beats/minute

In table 4.2 found the pulse rate against the normal range lies 98% has been under the reference range, 02% pulse rate has been above the normal range. The % SPO_2 against the normal range lies 0% has been under the reference range, 100% - %SPO_2 has been above the normal range. As per the physical strength of a sports person is normal in given study.

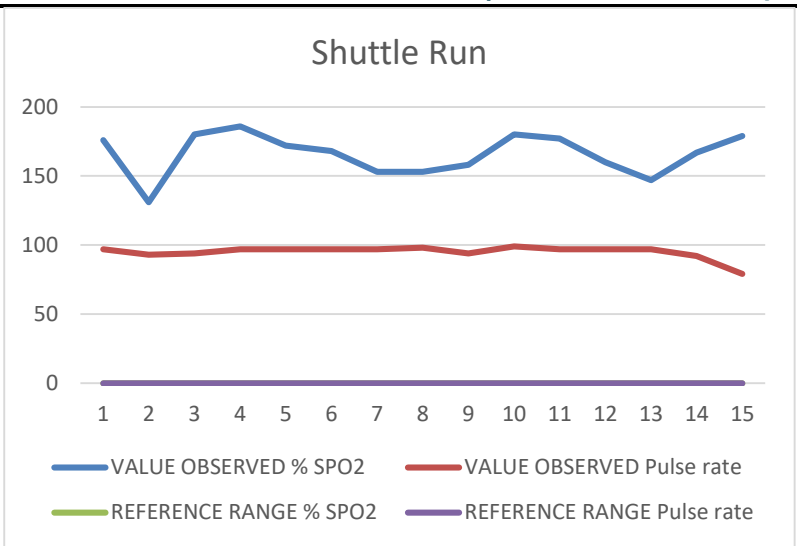

Figure 4.2 value observed after after shuttle run

Table 4.3 To observed the pulse rate after yoga exercise

S.NO.	VALUE OBSERVED		REFERENCE RANGE	
	% SPO_2	Pulse rate	% SPO_2	Pulse rate
1	153	80	94% to 99%	60 to 100 beats/minute
2	136	97	94% to 99%	60 to 100 beats/minute
3	123	97	94% to 99%	60 to 100 beats/minute
4	95	90	94% to 99%	60 to 100 beats/minute
5	137	97	94% to 99%	60 to 100 beats/minute
6	134	99	94% to 99%	60 to 100 beats/minute
7	121	99	94% to 99%	60 to 100 beats/minute
8	138	99	94% to 99%	60 to 100 beats/minute
9	108	99	94% to 99%	60 to 100 beats/minute
10	153	98	94% to 99%	60 to 100 beats/minute
11	116	97	94% to 99%	60 to 100 beats/minute
12	87	93	94% to 99%	60 to 100 beats/minute
13	147	94	94% to 99%	60 to 100 beats/minute
14	120	92	94% to 99%	60 to 100 beats/minute
15	98	97	94% to 99%	60 to 100 beats/minute

In table 4.3 found the pulse rate against the normal range lies 100% has been under the reference range, 00% pulse rate has been above the normal range. The % SPO_2 against the normal range lies 2% has been under the reference range, 98% - %SPO_2 has been above the normal range. As per the physical strength of a sports person is normal in given study.

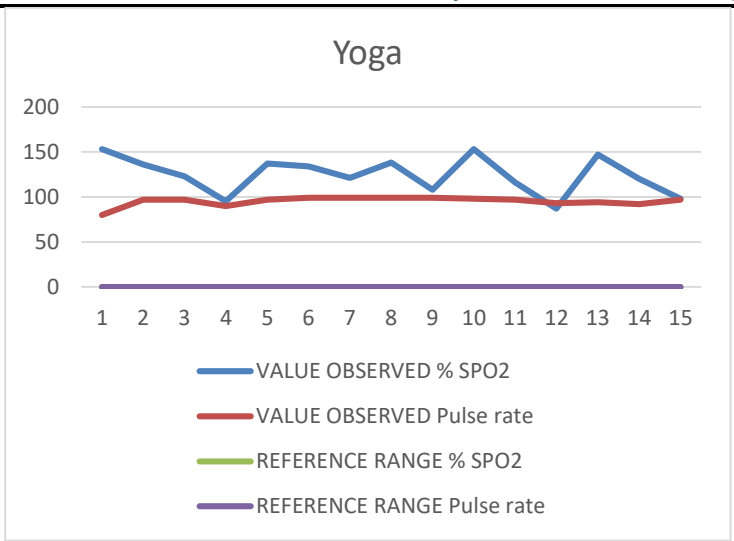

Figure 4.3 value observed after yoga exercise

The circulatory system response to an increased need for blood by adjusting the width of the blood vessel. As sports person needs to maintain the body temperature while work out to circulate the blood into circulatory system. As per the study to find out the strength of a sports person with the help of pulse rate and % SPO_2, by 1000mt race, shuttle run, yoga. Diastolic murmurs are characterized based on the part of the diastolic portion of the cardiac cycle during which they occur. It is caused by regurgitation flow of blood across a semi-lunar wall. Atrial contraction show in figure 4.4

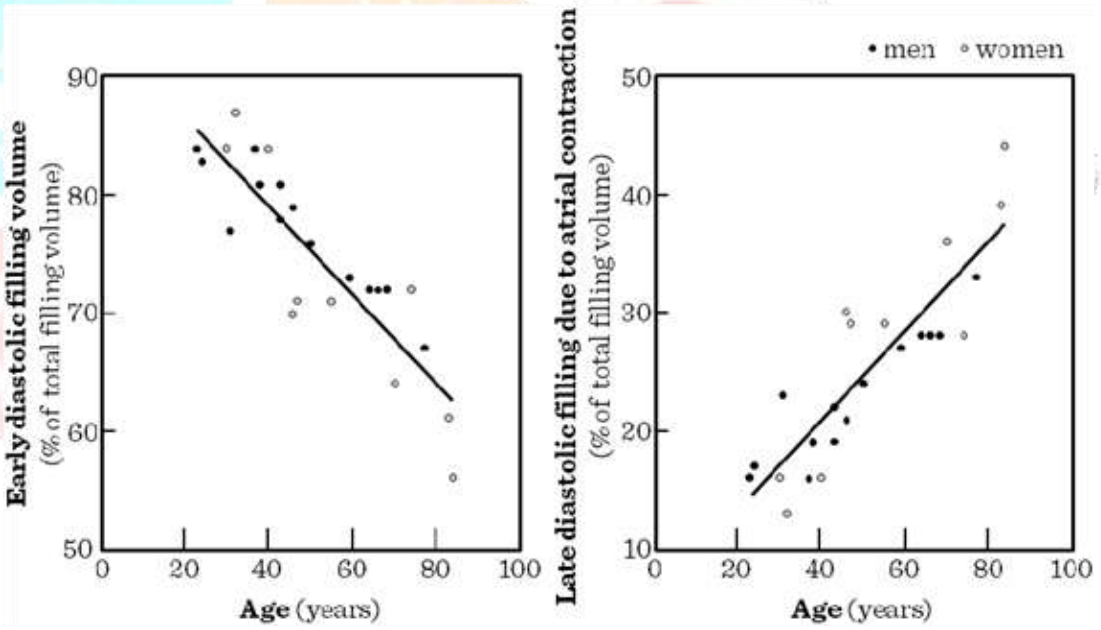

Figure 4.4 Comparison between the early diastolic and atrial contribution to left ventricular filling in persons of a broad age range

Early diastolic filling volume increase directly proportional to the age and the late diastolic filling due to atrial contraction is equally increase with the age factor the above figure 4.4 Comparison between the early diastolic and atrial contribution to left ventricular filling in persons of a broad age range.

That is why to be needed physical fitness to avoid any type of cardio vascular trouble in any group of age.

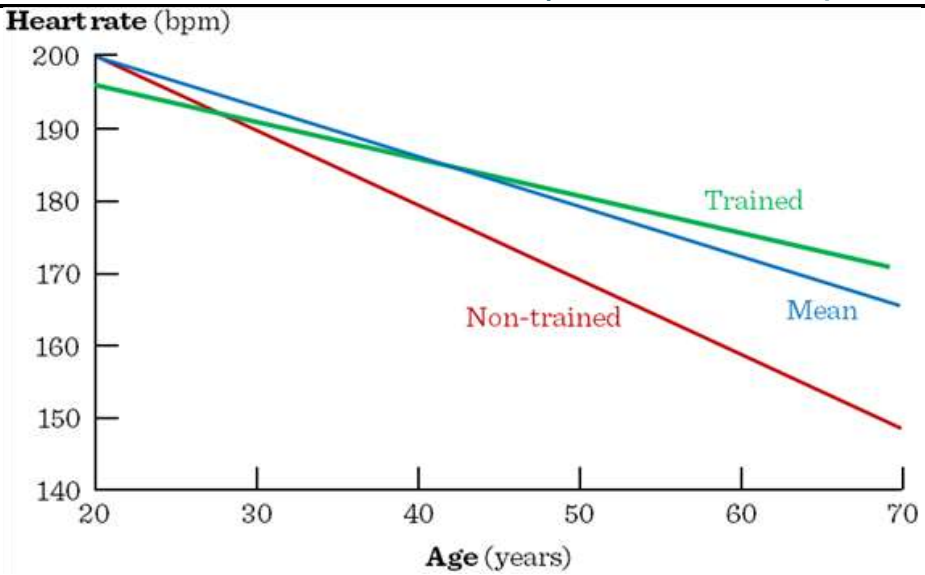

Fig. 4.5 Maximal heart rate vs. age

After observation the proposed methodology heart rate of any individual lies on the age of 70 is maximum the heart rate against the age shows the non trained and trained people. If we go for trained person the mean value showed very near to shown in the fig. 4.5.

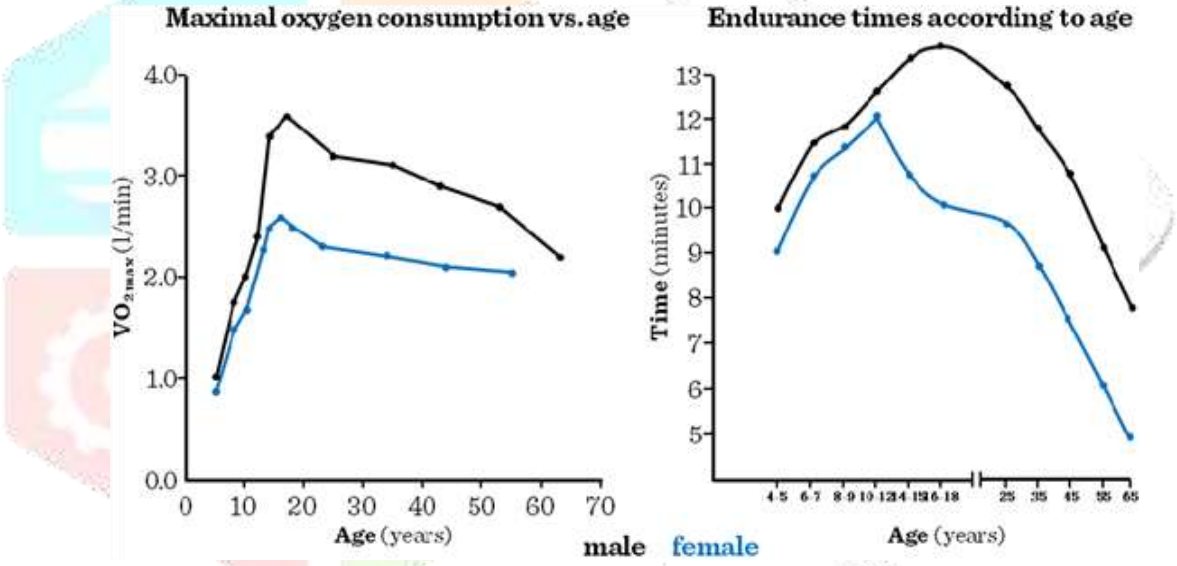

Figure 4.6 Maximal oxygen consumption and endurance times according to age. (data on trained and non-trained men)

As per the result of the study maximum number of age group is between 10 to 20 age group and the plotted graph figure 4.6 shows the volume of maximal oxygen consumption. Plotted graph between age and time factor the maximum concentration is lies between 18 year to 25 year of age. That shows the endurance time according to the age group in every minute. A solid fitness regimen benefits your entire body by boosting your circulation in surprisingly varied and vital ways, which makes sense when you remember how much of your body is touched by your vascular system. These are some of the key ways working out can improve your circulatory health.

1. Exercise promotes blood-vessel health.

A healthy vascular system can be measured in two ways: structure and function.

"Arteries are like tubes, with an outer wall and inner wall, and we can talk about both pieces being in good or bad health," explains Dengel. "In terms of wall thickness, being too thick is not structurally sound — we don't want stiff vessels. We want them to be very flexible."That leads directly to function. When vessels are flexible, they have elastic properties, like the ability to constrict and dilate when presented with changes in volume and pressure. Elasticity is the definition of a healthy artery. Exercise boosts vessel flexibility because "blood pressure goes up temporarily when we exercise, which forces the blood to flow faster and creates turbulence against the wall of the artery," he says. "It is like the artery itself is exercising."It's especially important to maintain vessel flexibility in middle age and beyond."Vessels are very plastic and can take a lot of abuse when we're young," says Dengel. "As we age, unhealthy lifestyle habits — consuming a lot of low-quality fats and sugary food and drinks, for instance — have more effect. Our vessels become more rigid."A wealth of research supports the idea that exercise helps prevent — and can even correct — some of that arterial damage. A 1993 study published in the journal *Circulation* examined 146 men and women, ages 21 to 96. Researchers found that higher physical-conditioning status, determined by VO2 max, was associated with reduced arterial stiffness. Another study found that the reduction of stiffness was associated with improvement of insulin resistance in type 2 diabetics. In addition to keeping blood vessels bendy, regular exercise has been shown to reduce arterial inflammation and reduce the dangerous buildup

of arterial plaque.In a 2009 study of mice, researchers found that a consistent daily exercise program over six months helped make existing plaques stronger and less likely to rupture (plaque ruptures can cause a heart attack or stroke).

Regular exercise has also been shown to prevent and dissolve blood clots by enhancing fibrinolysis, a process by which enzymes break down fibrin, a component of blood clots.

2. Exercise helps inoculate against chronic disease.

Vascular endothelial cells line every surface of the circulatory system, sheathing the heart, veins, arteries, and capillaries. These cells were once thought to be nothing more than a sort of biological cellophane wrapper, with only one function: to let a bit of water and some electrolytes pass through to tissues.

Researchers now know that these cells play a major role in maintaining optimal health. Damage to the endothelial lining has been linked to cardiovascular disease, stroke, insulin resistance, diabetes, kidney failure, and cancer.

Exercise puts pressure on the vascular endothelium — and that's a good thing. Experts believe the various types of stresses exercise induces prepare the endothelial cells to withstand everyday threats, whether it's inflammation from eating too much sugar or damage to the lung tissue from breathing smoggy air.

3. Exercise reduces heart-disease risk.

Movement improves vascular hormone production. In as little as a few weeks, exercise has been found to increase the production of atrial natriuretic peptide (ANP), the vascular hormone that counterbalances high blood pressure.

"Research has shown that older individuals who engage in exercise over the long term can see blood pressure improvements" similar to results from ACE inhibitors prescribed for hypertension, says Brad Dieter, PhD, research fellow at Providence Medical Research Center in Spokane, Wash.

High circulating levels of the vascular hormone brain natriuretic peptide (BNP), on the other hand, have been associated with increased risk for heart failure. According to a 2012 study published in the *Journal of Cardiovascular Disease Research*, endurance exercise, in particular, was found to reduce circulating concentrations of BNP.

4. Exercise bolsters athletic performance.

A stronger heart pumps more blood, more efficiently, to your lungs and throughout your body. More oxygenated blood reaches your muscle tissue — and when muscles have more oxygen for fuel, they can work harder, improving athletic performance.Over time, this higher volume of blood widens the blood vessels (another benefit) and builds new ones. "When you exercise, you create collateral vessels," says Dengel. So not only is more oxygen-rich blood being pumped by a stronger heart, but that blood has more routes to reach muscle tissue. At the same time, aerobic activity improves lung capacity — and greater lung capacity means more staying power in your favorite game or activity.

5. Exercise improves lymphatic function.

The lymph system — an extensive network of tissues, organs, and vessels that transport lymph fluid throughout the body — has two primary functions: balancing the fluids in the body and producing white blood cells that help fight off infection. The lymph system works in close concert with the blood vessels, and the robust circulation of lymph fluid is essential for optimal health.

Certain exercises promote the flow of lymph fluid. Jumping on a trampoline for just 10 minutes can enhance lymphatic activity. Inversions, like shoulder stands in some yoga practices, help drain lymph fluid and accelerate the rate at which lymph fluid is cleansed and filtered.

6. Exercise makes the heart bigger and stronger.

"Endurance training — like running or rowing — provides specific benefits to the heart," says Dieter. "The chambers of the heart get bigger."

The simple advice to move more — no matter what type of movement you choose — recalls the old saying that the best exercise is the one you will actually do. So whether your passion is golf, doing cartwheels, or Olympic lifting, the fact that you are moving is what matters. Movement is medicine for circulatory health risk factors.

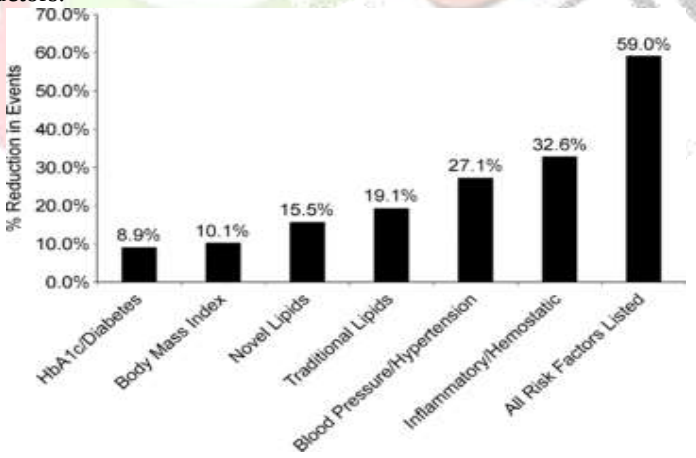

Figure 4.7 shows the percentage of reduction in coronary heart disease

Effects of >1500 *versus*<200 calories per week of exercise/physical activity on risk factors and their impact on coronary heart disease and cardiovascular disease The filled bars show the risk reduction due to high levels of physical activity for all traditional risk factors in combination and for specific individual risk factors. The effects of exercise on traditional risk factors explained less than half the risk of coronary heart disease and ~60% of cardiovascular disease. Data from Mora *et al.* (2007). HbA1c = elevated glycosylated hemoglobin.

Conclusion

The results of the continuous exercises positively and long term on cardiovascular system. Athlete's heart is more efficient to work then the untrained heart. Blood delivers all nutrients & O2 to the tissues and carries out the waste products. If a sports person wants to achieve high & higher level in sports then he/ she must exercised his/her body. To achieve an optimal level of fitness it must be ensure that circulation of blood should be in good condition. Fitness & circulation of blood is directly proportional to each other. Our sports performance depends on our fitness level. If we will do continue exercise then we improve the efficiency of our cardiovascular system. Exercise is part of key components of achieving high level of performance in sports. Regular exercise reduces the risk of chronic metabolic and cardio respiratory diseases, in part because exercise exerts anti-inflammatory effects. However, these effects are also likely to be responsible for the suppressed immunity that makes elite athletes more susceptible to infections. The anti-inflammatory effects of regular exercise may be mediated via both a reduction in visceral fat mass (with a subsequent decreased release of adipokines) and the induction of an anti-inflammatory environment with each about of exercise. In this final conclusion, we focus on the known mechanisms by which exercise — both acute and chronic — exerts its anti-inflammatory effects, and discuss the implications of these effects for the prevention and treatment of disease.

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