LAB REPORT

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Class: DP1

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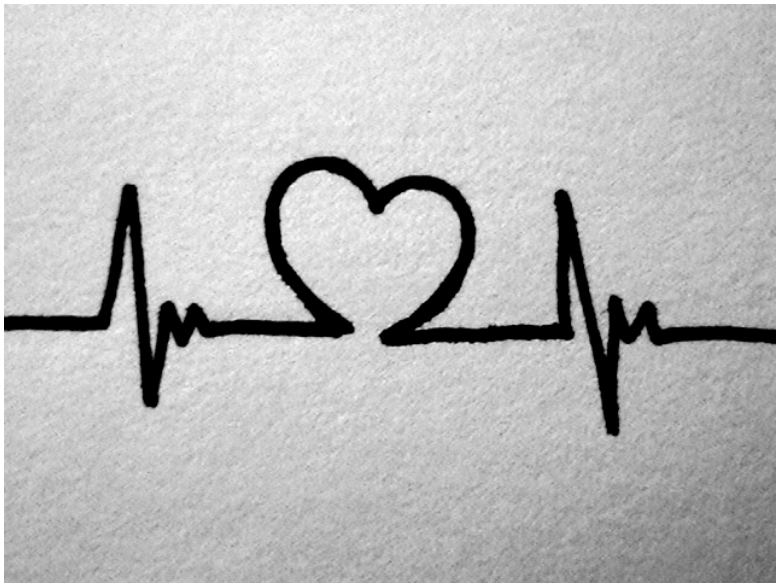
Experiment purpose: How Does Affect Exercises And Tea Heart Rate And Blood Pressure rate as well.



Introduction:

The heart is situated in the chest area of the organism. Its function is to pump oxygen carried by the blood throughout the body. This process is better known as respiration and it's done by CO_2 which is blow out. The level of CO_2 and O_2 affect the heart beat rate. There are many factors that may affect the heart rate such as exercise, emotions and feelings, age, gender, diet.

During strong exercise the body needs a lot more energy. The energy comes from breathing deeper and faster and. This further oxygen is then used to release more energy, needed to meet the higher level of demand. So this leads to a higher rate of heart beat.

The Standard Pulse Rate and Blood Pressure are generally around 70 (BPM) & 120/80 (mmHg), Blood Pressure is separated into two measurement Systolic/Diastolic.

The objective of this experiment was to investigate factors which affects the pulse rate and to what extent can these factors affect the heart beat of humans.

I will be testing these factors by two different kind of experiment firstly after drinking a cup of tea, and secondly after doing a hard exercise.

FIRST EXPERIMENT (TEA):

Materials:

-Tea bag
- boiling water at 100 Celsius
- 275 ml glass cup
- Stethoscope.
-Sphygmomanometer ±5 mmHg
-Stopwatch ±0.01 sec.

General Information:

Blood pressure and Pulse rate must be measured with a beat Per Minute (BPM) and the pulse rate with Millimetre of Mercury

Variables:

a) **Independent**: amount of tea.

b) **Dependent**: -The results of different values of blood pressure and pulse rates (-Pulse Rate ±1 BPM) I reached.

c) **Controlled**: -The period and amount of minutes that were regular between each trial (1 minute).

Method:

I) First I measured my BP and PR at a completely rest, my Pulse Rate and Blood Pressure at rest were: 70 & 130 over 90, which is the standard measurements ad the normal ones for a 16 years old as I am.

II) Then I made a cup of tea by letting the tea bag for a while to be concentrated and to touch the differences while measuring the data after the experiment, then i drank it slowly

III) After ten minutes I measured my blood pressure and my pulse rate.

IV) And then I kept re-measuring my blood pressure and pulse rate every 1 minute, I kept doing it for 5 consequently times.

This is what I got from my measurements

Time (minutes) ± 0.01 sec	Pulse Rate (BPM) ± 1	Blood Pressure (mmHg) ± 5	
		Systolic	Diastolic
1	100	85	75
2	100	95	70
3	110	90	60
4	120	85	65
5	110	90	70

From the first look at the data I got after measurements we can say that the both the pulse rate and the blood pressure doesn't have a particular scale or a certain sequences, as they varies from high to low in each measurements, if w compare the 2nd with the 4th for example !

Processing Data

Now let's put this data on another way of presentation, by their percentages evaluating both the pulse rate and the blood pressure with its two types (Systolic and Diastolic), to illustrate better the patterns of the experiment...

Pulse Rate:

my Pulse Rate at rest were: 70	Pulse Rate	Percentage Of Change ± 0.1%
General form to get the percentage change of the pulse rate between a t rest and after drinking tea: $pulse\ rate = \left(\frac{after\ \exp - intial\ meas.}{intial\ measurement}\right) * 100$ *: exp is experiment meas: is measurments	100	$\left(\frac{100-70}{70}\right) \times 100 = 42.9\%$
	110	$\left(\frac{110-70}{70}\right) \times 100 = 57.1\%$
	120	$\left(\frac{120-70}{70}\right) \times 100 = 71.4\%$
	110	$\left(\frac{110-70}{70}\right) \times 100 = 57.1\%$
	90	$\left(\frac{90-70}{70}\right) \times 100 = 28.6\%$

Blood Pressure:

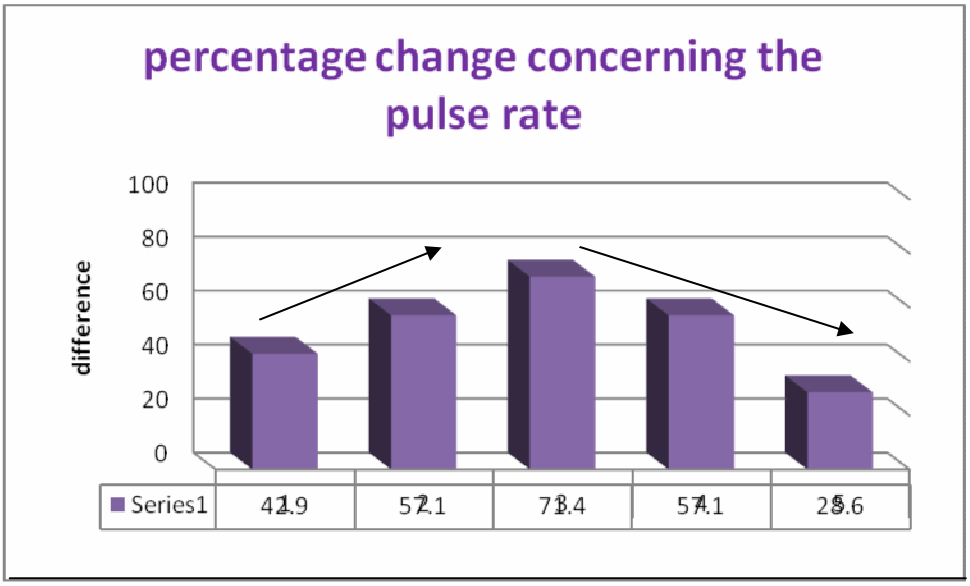
Systolic:

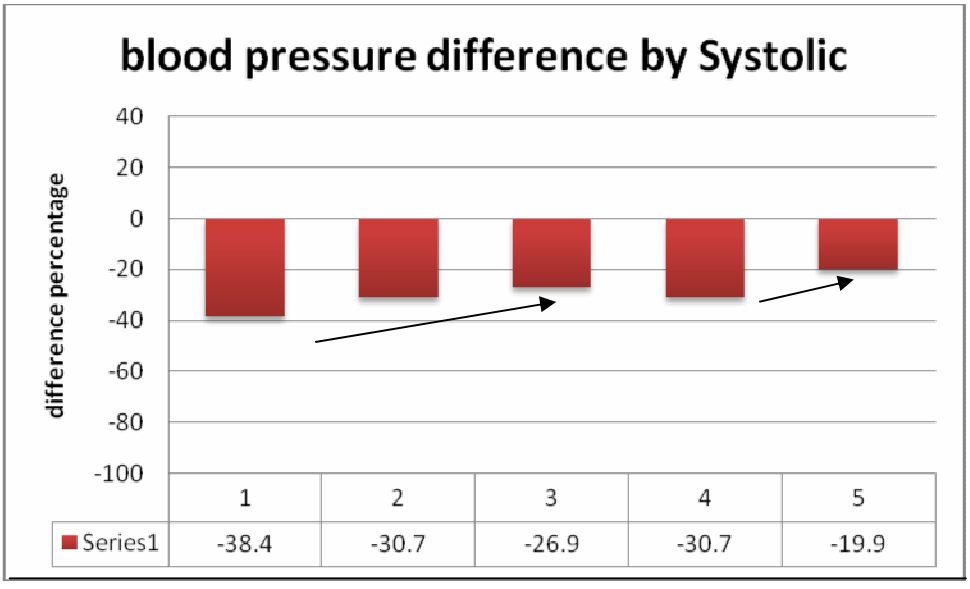
The initial measurement says that the blood presuure systolic rate is 130	Systolic	Percentage Of Change ± 0.1%
General form to get the percentage change of the blood pressure, systolic rate between a t rest and after drinking tea: $systolic\,rate = \left(\frac{after\ \exp - intial\ meas.}{intial\ measurement}\right) * 100$ *: exp is experiment meas: is measurements	80	$\left(\frac{80-130}{130}\right) \times 100$ = -38.4%
	90	$\left(\frac{90-130}{130}\right) \times 100$ = -30.7%
	95	$\left(\frac{95-130}{130}\right) \times 100$ = -26.9%
	90	$\left(\frac{90-130}{130}\right) \times 100$ = -30.7%
	105	$\left(\frac{105-130}{130}\right) \times 100$ = -19.9%

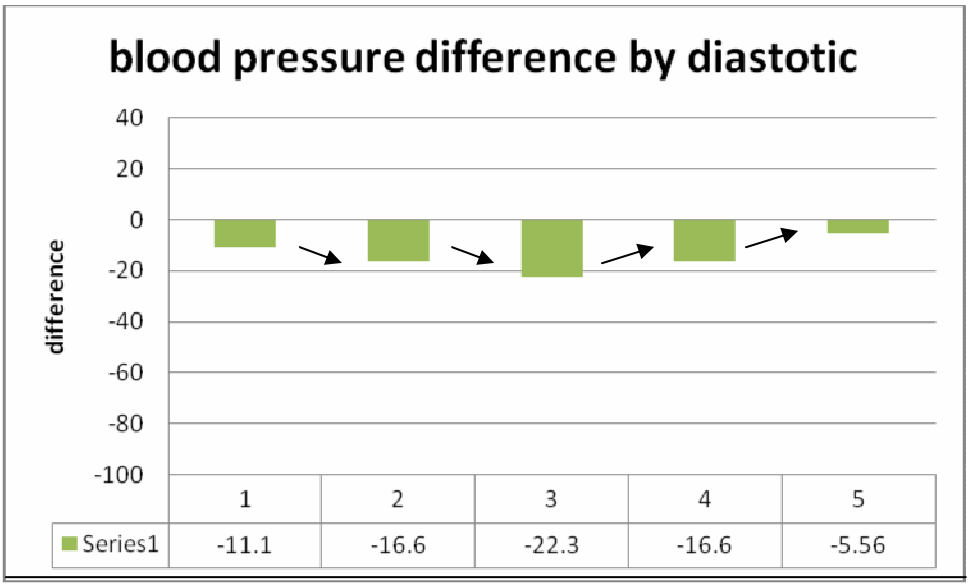
Diastolic:

The initial measurement says that the blood pressure Diastolic rate is 90	Diastolic	Percentage Of Change ± 0.1%
General form to get the percentage change of the blood pressure, Diastolic rate between a t rest and after drinking tea: $Dias\,rate = \left(\frac{after\ \exp - intial\ meas.}{intial\ measurement}\right) * 100$ *: exp is experiment meas: is measurements	80	$\left(\frac{80-90}{90}\right) \times 100$ = -11.1%%
	75	$\left(\frac{75-90}{90}\right) \times 100$ = -16.6%
	70	$\left(\frac{70-90}{90}\right) \times 100$ = -22.3%
	75	$\left(\frac{75-90}{90}\right) \times 100$ = -16.6%
	85	$\left(\frac{85-90}{90}\right) \times 100$ = -5.56%

Then now let's put all this data in three different diagrams to see how does they affect on the blood pressure and the pulse rate as well:







So I can deduce that] the tea decreases my pulse rate and decreases my blood pressure, as mentioned in the graphs and as shown in their percentage of change between the initial and the second measurements, which means that tea is a good drink for people who get nervous quickly. After drinking tea to see its effects on the blood pressure and heart rate. At Actually I predicted that there will be an increase in my blood pressure and my pulse rate, but my experiment my expectations was wrong, or the opposite I mean. Tea has decreased my PB and as well as my PR

Limitations/Methods Of Improvement:

There were various limitations during my experiment; uncertainties were a a little bit high (±5 mmHg and ±1 BPM) except for the Stopwatch which had an uncertainty of ±0.01 sec and the percentage of difference as it was ± 0.1% , also their was a limitation that during taking the measurements after finishing use the actual experiment I was walking and going down stairs, which may has also affected my degree of accuracy of measurements and also has led to limitations that has negative effects on my raw data.

so to improve this in the next experiment, more sophisticated materials and devices as using electric or automatic devices, because they may come with some unreal results.

2ND EXPERIMENT (EXERCISE):

Materials:

a)Stopwatch – ±0.01 sec
b)Number of people required – 2
c)A floor of steps (stairs with 25 steps)
d)Stethoscope.
e)Sphygmomanometer ±5 mmHg

Variables:

a) **Independent**: Amount of exercise done

b) **Dependant** : Heart beats

c) **Controlled**: type of exercise, weather, time

The exercise that will be performed will be same for every trial; only, the amount of exercise done will be fair. I while performing the experiment
I except starting doing this second experiment that when the amount of exercise performed increases, the number of heart beats per minute will also increase steadily till a certain point.

Method:

1) Measurement of my heart beat before the experiment

2) Start the experiment by doing the exercises, going up and down with stairs in on flight (25 steps)

3) Measure the number of heartbeats every 1 minute by using a stopwatch

4) Repeat the exercise 3 times with doubling the distance that i took

5) After that, I should perform completely relax and do not eat or drink or even walk after the exercise to have an accurate and successful data

these are the results of my experiment...

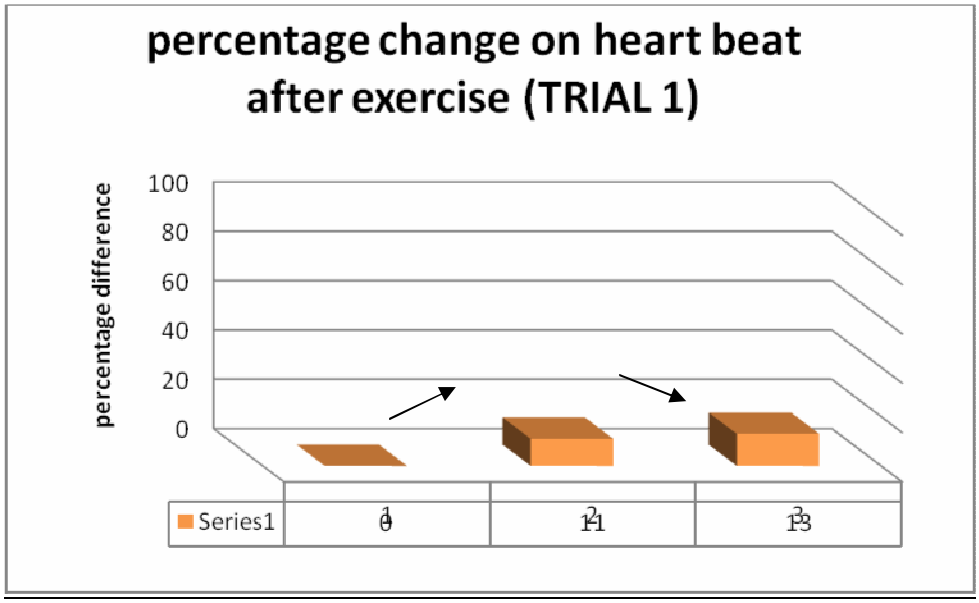
measurements of heartbeats

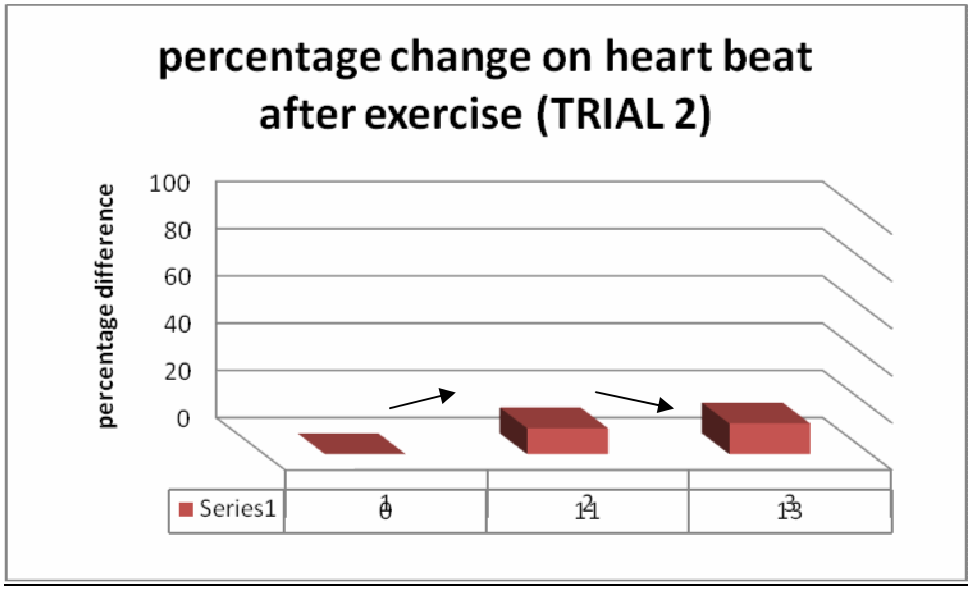
Units of exercise, (22 steps = 1unit)	Initial heart rate first trial	Heart rate after exercise first trial	Initial heart rate second trial	Heart rate after exercise Second trial
25 steps	88	139	144	143
50 steps	-	154	-	161
100 steps	-	150	-	163

Processing Data

Percentage change on heartbeats, starting with the first trial then the second one....

Units of exercise, (26 steps = 1unit)		Calculations	Percentage change (min) ± 0.1%
25 steps	Trial !	$\frac{139-88}{88} \times 100$	57%
	Trial 2	$\frac{143-144}{144} \times 100$	0%
50 steps	Trial 1	$\frac{154-88}{88} \times 100$	75%
	Trial 2	$\frac{161-144}{144} \times 100$	11%
100 steps	Trial 1	$\frac{150-88}{88} \times 100$	69%
	Trial 2	$\frac{163-144}{144} \times 100$	13%





To conclude, from both graphs, we can deduce finally that "the rate at which the heart beats is affected by the amount of exercise performed". This is because when we exercise, the rate of oxygen in the blood and the body is used quicker than usual or at rest, as we see if we compare the rate of decrease on both graphs, trial one and the other, the second one has a lower rate of decrease than the one above, which agrees and support the statement above and the one coming down. "But later, the heart becomes stronger due

to its continual pumping of blood throughout the body". The number of heart beats per minute also depends on my fitness, which is a limitation.. From this experiment and the results, we can say that my expectations was proven correct.

Limitations

'The number of heart beats per minute depends on certain conditions of the body such as exercise and any pressure physical or mental that is applied on a person affects the rate at which the heart beats', which was my situation because I was having a exam period during the experiment process
I could have some errors concerning counting the number of heart beats and also could have been an error in the counting of 1 minute on the stopwatch, both of these limitations are under the title high uncertainties rate which I may improve next time by minimizing these rates of errors

Finally concerning the two experiments, the one for the drinking of tea and the other of the exercise, I can say that if discovered lots of valuable tricks and info during both the experiment process and the lab report as well...