



Monitoring The Changes in Oxygen Levels of Different Exercises

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Background

Problem: Many people around the world exercise to stay healthy and fit. It is important to understand how oxygen consumption affects the body and how to maintain a healthy lifestyle. There are different workouts that help with different parts of the body and everyone has their own needs. People who are working on consuming more oxygen must understand how to effectively workout.

Description: By conducting this research, it will allow people to understand which type of exercise helps improve oxygen levels and maintain a good balance of oxygen consumption.

Experimental Question

What exercise group showed the greatest improvement in oxygen levels throughout the duration of 3 weeks?

Hypothesis

The running group will show the greatest improvement in oxygen levels throughout the duration of 3 weeks.

Materials

- Oxygen Tracker (to track oxygen levels)
 - Product Name: Fingertip Pulse Oximeter Bluetooth Blood Oxygen Saturation Monitor and Pulse Rate Monitor for Apple and Android, with OLED Screen 2 X AAA Batteries and Lanyard
 - Brand/Manufacturer: HealthTree
 - Item Weight: 2.12 ounces
 - Product Dimensions: 2.36 x 2.76 x 1.97 inches
 - Color: Black
 - ASIN: B09MVYNYQ5
 - Country of origin: China
 - Item Model Number: JKS50B
- Exercise Equipment (varies for each group)
- Google Sheets (to collect data)

Procedure

1. Running (5 participants)
 - Running at steady pace on the treadmill at 6 mph for 30 minutes with no incline
2. Biking (5 participants)
 - Cycling for at least 30 minutes at a steady pace around 15.5 mph speed at a 1% incline
3. Muscle Training/Lifting (5 participants)
 - Bench Press 35 lbs 10 reps x 4, Rest Time: 30 seconds
 - Shoulder Press 40 lbs 15 reps x 3, Rest Time: 30 seconds
 - Deadlift 50 lbs 20 reps x 2, Rest Time: 30 seconds
 - Bent-Knee Deadlift 40 lbs 15 reps x 4, Rest Time: 30 seconds
 - Half Squat 40 lbs 20 reps x 3, Rest Time 30 seconds
4. All types of exercise (5 participants)
 - Run at a steady pace on the treadmill at 5-6 mph for around 15 minutes with no incline
 - Bench Press 35 lbs 10 reps x 4, Rest Time: 30 seconds
 - Shoulder Press 40 lbs 15 reps x 3, Rest Time: 30 seconds
 - Instead of this workout, could play a sport (Basketball or Volleyball) for 30 minutes

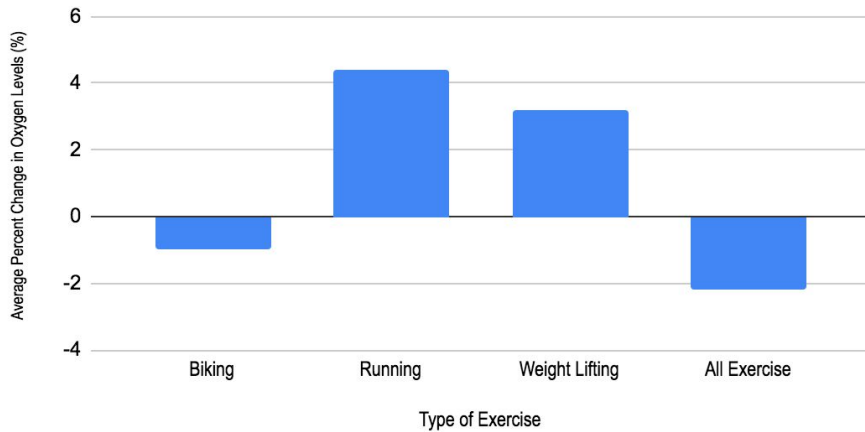
Procedure

Steps:

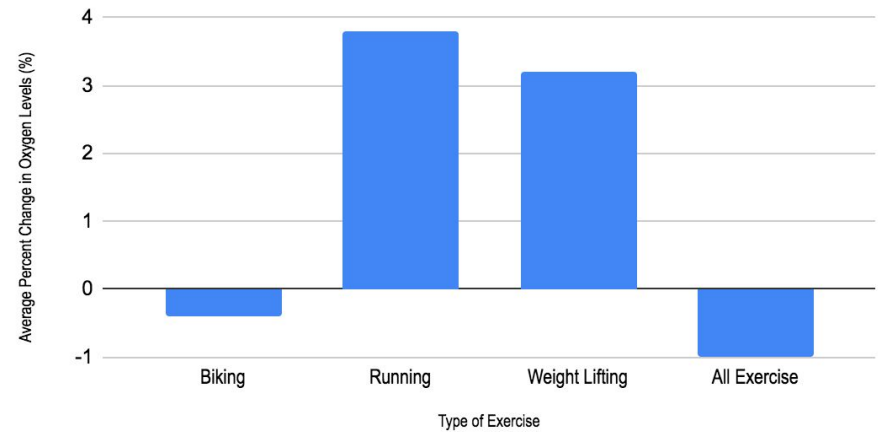
1. There are a total of 20 participants with 5 participants (Age Range: 17-50) in each of the 4 exercise groups (Biking, running, muscle training, and all types of exercise)
2. For a duration of 3 weeks (Jan 2 - Jan 20), for 5 days a week, each participant will perform at least 30 minutes of their workout and measure their oxygen levels before and then measure their oxygen levels after
3. Collect all the data and analyze the results

Data

Day 1 - Average % Change in Oxygen Levels Before and After Exercise



Day 21 - Average % Change in Oxygen Levels Before and After Exercise



Analysis

The average percent change in oxygen levels for the running group day 1 was 4.4%, for the biking group day 1 it was -1%, for the weight lifting group day 1 it was 3.2%, and for the all exercise group it was -2.2%. The running group showed the greatest change in oxygen levels from just day 1. The average percent change in oxygen levels for the running group day 21 was 3.8%, for the biking group it was -0.4%, for the weight lifting group it was 3.2%, and for the all exercise group it was -1%. The running group showed the great change in oxygen levels from just day 21. The all exercise group showed the greatest change (1.2%) in oxygen levels from day 1 to day 21.

Summary

Exercise can help control or modify many of the risk factors for heart disease. People who exercise regularly are less likely to suffer a sudden heart attack or other life-threatening cardiac event. By conducting an experiment about the effect of oxygen consumption and heart rate on the human body, it will lead to gathering more data to help understand how to keep the heart stable and at a normal heart beat. Overall, after conducting this research, the group that showed the most improvement in oxygen levels throughout the duration of 3 weeks was the all exercise group. This rejected my initial hypothesis that the running group would show the greatest improvement in oxygen levels.

Future Work

1. To continue this research:
 - Add different types of exercise
 - More participants with different age ranges
2. What exercising method helps with people who are at risk for heart problems, and how to effectively maintain a healthy lifestyle?
3. What part of the heart is greatly benefitted due to physical activity?