

Final Report - Workout Success Prediction

For my project, I wanted to answer the question of which variables are the best predictor of a successful workout? I obtained a data set from Kaggle that included the following information: calories burned per workout session, max heart rate achieved, workout duration, age, gender, weight, height, BMI, workout type, session duration, workout frequency, experience level, water intake during workouts, and fat percentage. For this project, I defined a successful workout as one where more calories were burned. I used a multivariable logistic regression model to determine which of these variables were the best to predict a successful workout.

The data includes 4 main types of workouts: HIIT, yoga, cardio, and strength. The main goal of HIIT and Cardio is to burn calories. On the other hand, yoga focuses on mindfulness, flexibility, and balance. Additionally strength training, while it can burn calories, also has other factors like your muscle growth and calories burned outside of your workout which are variables not represented by the data. Because I am using calories burned as our target variable, strength and yoga data will be excluded from this prediction model. This is because the focus of these exercises is not directly on burning calories whereas HIIT and Cardio are more aligned with that metric.

The top predictors of a successful workout by calories burned was session duration and average BPM. This makes sense because the longer you workout, the more time you have to burn calories and average bpm is a typical indicator of overall workout intensity. The next highest predictor of workout intensity was "Gender Male". The reason for this being a predictor of a more successful workout is not because men have more successful workouts than women, but because men on average have more muscle mass and less body fat than women. According to the mayo clinic, "Men usually have less body fat and more muscle than do women of the same age and weight. That means men burn more calories" (Mayo Clinic).

Workout Frequency, BMI, and water intake all showed some correlation to a successful workout as well. Workout frequency and BMI could be possible indicators of someone who is more serious about working out and therefore is more prone to having a successful workout. Additionally, if you consume more water, you are better fueled for whatever you are doing and therefore more likely to expend more energy. Age, fat percentage, weight, and experience level

all play no impact in predicting a successful workout. This shows that there are no restrictions or barriers to completing a successful workout.

In conclusion, I found that the most successful workouts were longer and more intense than other less successful workouts. This model could be applied as a tool to help people structure workouts that are more effective and meet their needs. This model would be especially useful to those trying to get into working out, but they do not have the knowledge base to get into it. If I had more time to complete this project, I would have liked to have seen more data sets come into play with metrics like muscle mass, mental health, and stress levels. This is because there are many different reasons people workout that should not be overlooked.