Exploring the Ratio of Dumbbell Press to Flat Bench Press

**Many weightlifters wish to track the ratio between the weight they use for dumbbell press (using two, equal size dumbbells), compared to flat bench press, (using a bar and equal size plates on either side).The goal of the ratio is to compare how much someone is lifting two dumbbells versus how much they are able to lift the weighted barbell. You obtain the ratio by multiplying the weight of one dumbbell by 2 (to account for the two weights that the person would hold) and dividing that weight by the amount someone is able to barbell bench press.**

**Below is a dataset with observations from 18 weightlifters and their corresponding ratio.**

A screenshot of a calculator

Description automatically generated**1. What is the average ratio between dumbbell press and flat bench press?**

0.7256667

**2. Find the values for the first and third quartiles of this data set and interpret what they mean.**

1st quartile: 0.6650 – This is the 25th percentile, meaning that 25% of the ratios between dumbbell press and flat bench press are smaller than 0.6650

3rd quartile: 0.8020 – This is the 75th percentile, meaning that 75% of the ratios between dumbbell press and flat bench press are smaller than 0.8020

**3. Find the interquartile range (IQR) for the 18 weightlifters**

0.8020 –0.6650 = 0.137

**4. Create a 95% confidence interval for the mean ratio between dumbbell press and flat bench press and interpret it.**

0.6822360 and 0.7690974

We can say with 95% confidence that the population mean ratio between dumbbell press and flat bench press will be between 0.6822360 and 0.7690974

**5. Create a 99% confidence interval for the mean ratio between dumbbell press and flat bench press and interpret it.**

0.6660064 and 0.7853269

We can say with 99% confidence that the population mean ratio between dumbbell press and flat bench press will be between 0.6660064 and 0.7853269

**A graph of a bar graph

Description automatically generated6. Based on the histogram, how many weightlifters had ratios above 0.7? How many weightlifters had ratios below?**

8 above 6 below

**7. Approximately what percentage of the weightlifters observed have a ratio of 0.7 or above?**

12/18 = 2/3 = 66%

**8. The graph to the right shows a histogram of the data. Based on the graph, what could be a concern and what is a possible solution.**

The small sample size means it is hard to get a full picture of what the data means and can tell you because there is a lot that isn’t being explained. The solution would be to gather more data points so you can get a better idea and a better distribution.

**9. What potential problems could arise from the way the data was collected?**

Since the data was based on self-reporting and from an online open forum such as Reddit, we can’t guarantee that the data is 100% correct or reflective of the entire population. There is bound to be bias and noise in the data as people who are looking at this reddit thread are already involved in the weightlifting community and part of the target audience. They might have higher ratios compared to the average person.