Assignment 2

In a study of the effects of exercise on weight loss, 500 individuals were randomly assigned to one of two groups. Group A performed cardiovascular exercise, while Group B performed resistance training. The goal was to determine which type of exercise leads to greater weight loss.

1. Formulate a null hypothesis and an alternative hypothesis for this study.

2. Which measure of central tendency and variability is most appropriate for analyzing the weight loss data? Explain your choice.

3. The results of the study showed that Group A lost an average of 5 kg with a standard deviation of 2 kg, while Group B lost an average of 3 kg with a standard deviation of 1.5 kg. Perform a hypothesis test to determine if there is a significant difference in weight loss between the two groups at a 0.05 significance level.

4. Interpret the results of the hypothesis test. What conclusion can be drawn about the effectiveness of cardiovascular exercise versus resistance training for weight loss?

5. What assumptions are necessary for the hypothesis test to be valid? List and briefly explain each assumption.

6. Explain the importance of random assignment in this study. What is the purpose of random assignment in research design?

7. A researcher is interested in studying the effects of exercise on blood pressure. How would you design an experiment to test this hypothesis? Identify the independent and dependent variables, as well as any control variables.

8. In the assignment, the null hypothesis is H0: μA = μB, where μA and μB represent the mean weight loss of Group A and Group B, respectively. What does this hypothesis state about the difference in weight loss between the two groups?