

Statistical Treatment for Quantitative Research

Title

The Impact of Daily Exercise on Student Academic Performance

Abstract

This study investigates whether students who exercise regularly perform better academically. Data was collected from 250 students, recording their exercise habits and GPA. Statistical methods were applied to analyze the relationship between physical activity and academic success.

Introduction

Physical activity is often linked to better cognitive function, but its direct impact on student performance remains unclear. This study aims to quantify the relationship between exercise and GPA.

Methodology

A group of 250 students was surveyed on their weekly exercise hours. Their GPA records were collected and analyzed using statistical treatment methods.

Statistical Treatment

1. Descriptive Statistics

- Mean, median, and standard deviation were used to summarize exercise hours and GPA.

- Frequency distribution was applied to categorize students based on activity levels (low, moderate, high).

2. Correlation Analysis

- Pearson's correlation coefficient (r) was used to measure the strength and direction of the relationship between exercise hours and GPA.

3. Regression Analysis

- A linear regression model was applied to predict GPA based on exercise time. The equation $Y=a+bX$ was used, where Y is GPA and X is exercise hours.

4. T-Test

- An independent t-test was conducted to compare GPA differences between students who exercised regularly and those who did not.

Results

Statistical analysis revealed a positive correlation ($r = 0.72$), indicating that students who exercised more had higher GPAs. The t-test showed a significant difference in academic performance between active and inactive students.

Discussion

The results suggest that regular exercise contributes to better academic performance. Students who maintained a balanced exercise routine performed better in exams.

Conclusion

Exercise positively impacts academic success. Future research could explore how different types of physical activities affect cognitive function.

References

All sources used in the research, formatted according to academic citation standards.