

Gym vs. Sleep

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Question:

→ Does exercising affect the amount of sleep I get at night?

Data Collection Method

- I tracked my sleep for 14 consecutive days, recording the number of hours I slept each night.
- To make the study more accurate, I ensured my gym sessions were consistent each time.
- I measured my sleep duration by starting a timer before closing my phone and stopping it when I woke up.

Data

→ Variables:

→ Independent Variable:

Go to the gym? (Y/N)

→ Dependent Variable:

Sleep (hours of sleep)

Go to the gym?	Sleep hrs	Date
Yes	6	21-Nov
Yes	5.5	22-Nov
No	6.5	23-Nov
No	4	24-Nov
Yes	5	25-Nov
Yes	10	26-Nov
No	8	27-Nov
No	6	28-Nov
Yes	6	29-Nov
No	5	30-Nov
No	7	1-Dec
Yes	8	2-Dec
Yes	4	3-Dec
No	7	4-Dec

Hypothesis Testing

→ Claim: *The average number of hours I sleep on the days I go to the gym is greater than the average number of hours I sleep on the days I do not go to the gym.*

T-test

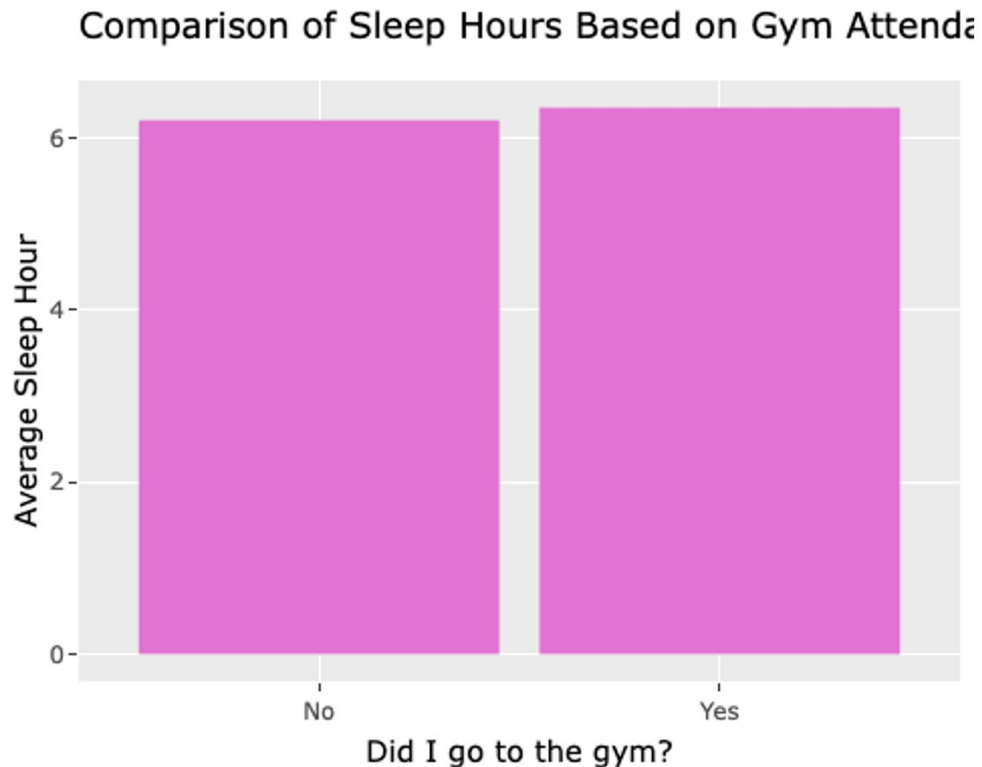
→ Null Hypothesis: *The average hours of sleep on the days I go to the gym is less than or equal to the average hours of sleep on the days I do not go to the gym.*

→ Alternative Hypothesis: *The average hours of sleep on the days I go to the gym is greater than the average hours of sleep on the days I do not go to the gym.*

```
##  
## Welch Two Sample t-test  
##  
## data: data$`Sleep hrs` by data$`Go to the gym?`  
## t = -0.15586, df = 10.482, p-value = 0.5604  
## alternative hypothesis: true difference in means between group No and group Yes is greater than 0  
## 95 percent confidence interval:  
## -1.796423 Inf  
## sample estimates:  
## mean in group No mean in group Yes  
## 6.214286 6.357143
```

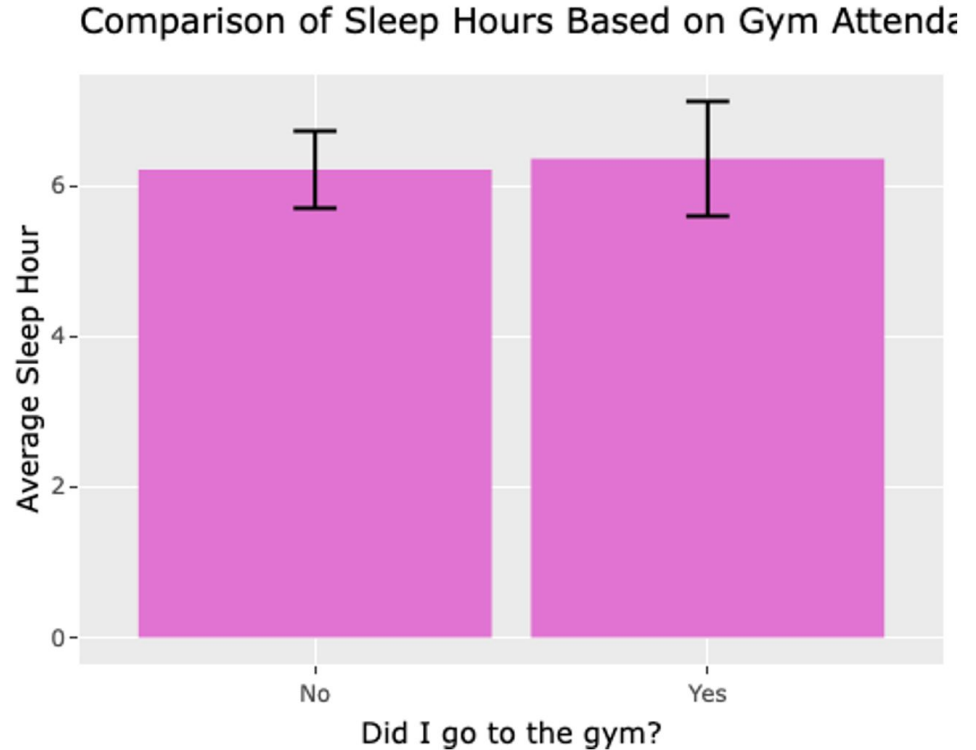
Graph Bar

→ The bar graph shows that there is little difference between the average sleep hours on the days I went to the gym and the days I didn't.



Error Bar Graph

→ The error bars overlap, indicating that there is no statistically significant difference between the two groups (gym vs. non-gym days).



Conclusion

- There is not enough evidence to support the claim that the average hours of sleep on the days I went to the gym is significantly higher than on the days I didn't.
- Supporting the conclusion:
 - **Statistical Result:** P-value was greater than the significant level. Indicating that I failed to reject the null hypothesis.
 - **Visual:** The bar graph shows no significant difference.
 - **Error bars:** The error bar graph showed overlapping which means that two groups are not statistically different.