Remote Learning and Well-Being

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Remote Learning

- Remote learning is when students learn over the internet
- Remote learning among children can lead to a “rise in temper tantrums, anxiety, and a poor ability to manage emotions”, according to a study at Harvard University [1]

1. https://www.gse.harvard.edu/ideas/edcast/22/02/negative-effects-remote-learning-childrens-wellbeing

How is the total time spent on remote learning related to different indicators of well-being?

Chaturvedi, Kunal & Vishwakarma, Dinesh & Singh, Nidhi. (2020). COVID-19 and its impact on education, social life and mental health of students: A Survey. *Children and Youth Services Review*. *121*. 10.1016/j.childyouth.2020.105866.

Our Data

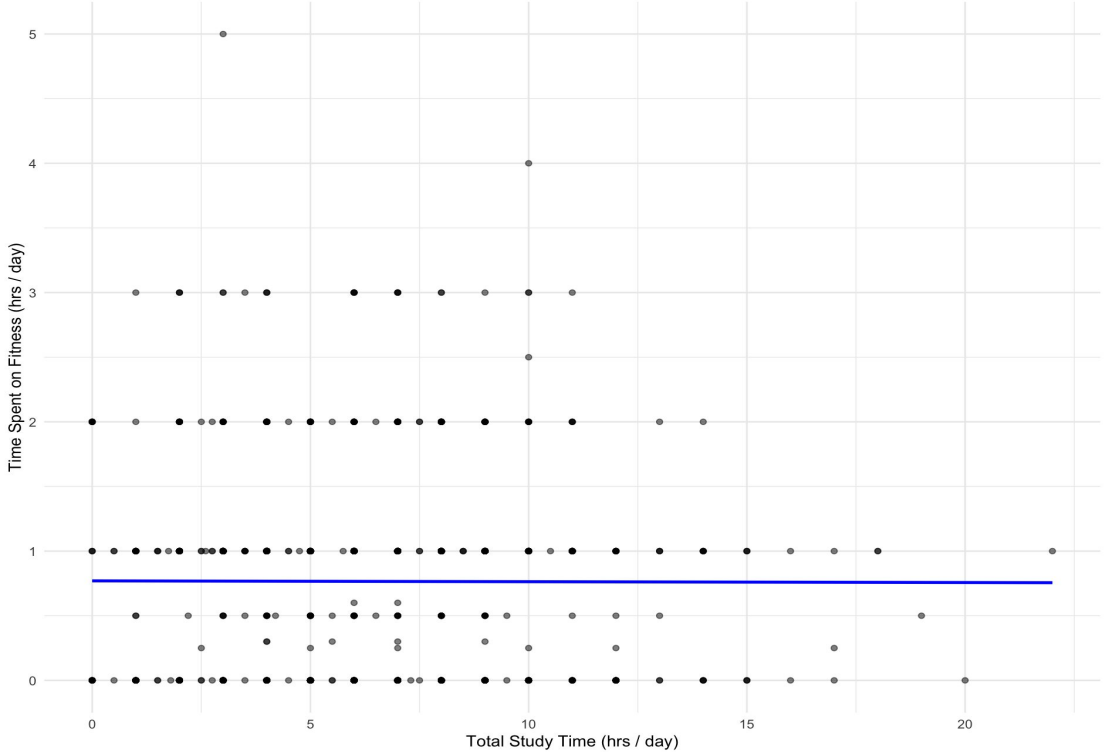
- Paper: “COVID-19 and its impact on education, social life and mental health of students: A survey”, published in December 2020
  - 1182 individuals of different age groups from different educational institutes in Delhi-National Capital Region in India
  - Goal: to identify negative impacts of COVID-19 to encourage public authorities to address these and enhance learning experiences

Our Data

- Predictor variable: created a column called “Total Study Time” combining time spent on online class and time spent on self study
- Outcome variables: time spent on fitness, time spent on sleep, number of meals per day, whether or not they felt more connected with family, close friends, relatives

Time spent on Online Class	Rating of Online Class experience	Medium for online class	Time spent on self study
2	Good	Laptop/Desktop	4
0	Excellent	Smartphone	0
7	Very poor	Laptop/Desktop	3
3	Very poor	Smartphone	2
3	Good	Laptop/Desktop	3

Total Study Time vs Fitness



r = -0.0028

y = -0.0006x + 0.77

Shows the relationship between *Total Study Time* and *Time spent on fitness*. Since the line of best fit is nearly horizontal, the two variables are almost completely independent. The correlation coefficient is -0.0028.

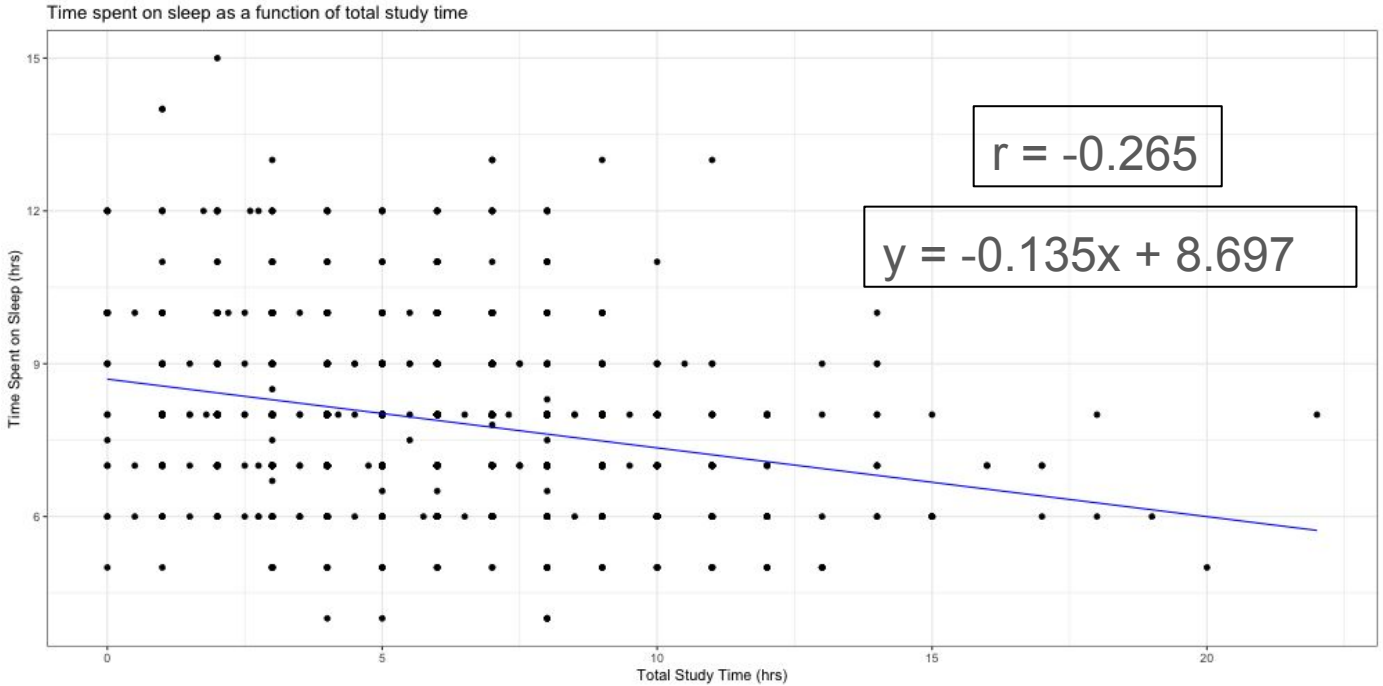
**Total Study Time* is the sum of *Time spent on Online Class* and T*ime spent on self study*

Conclusion

- Correlation coefficient of -0.0028
- An almost negligible negative correlation: as study time increases, fitness time decreases marginally

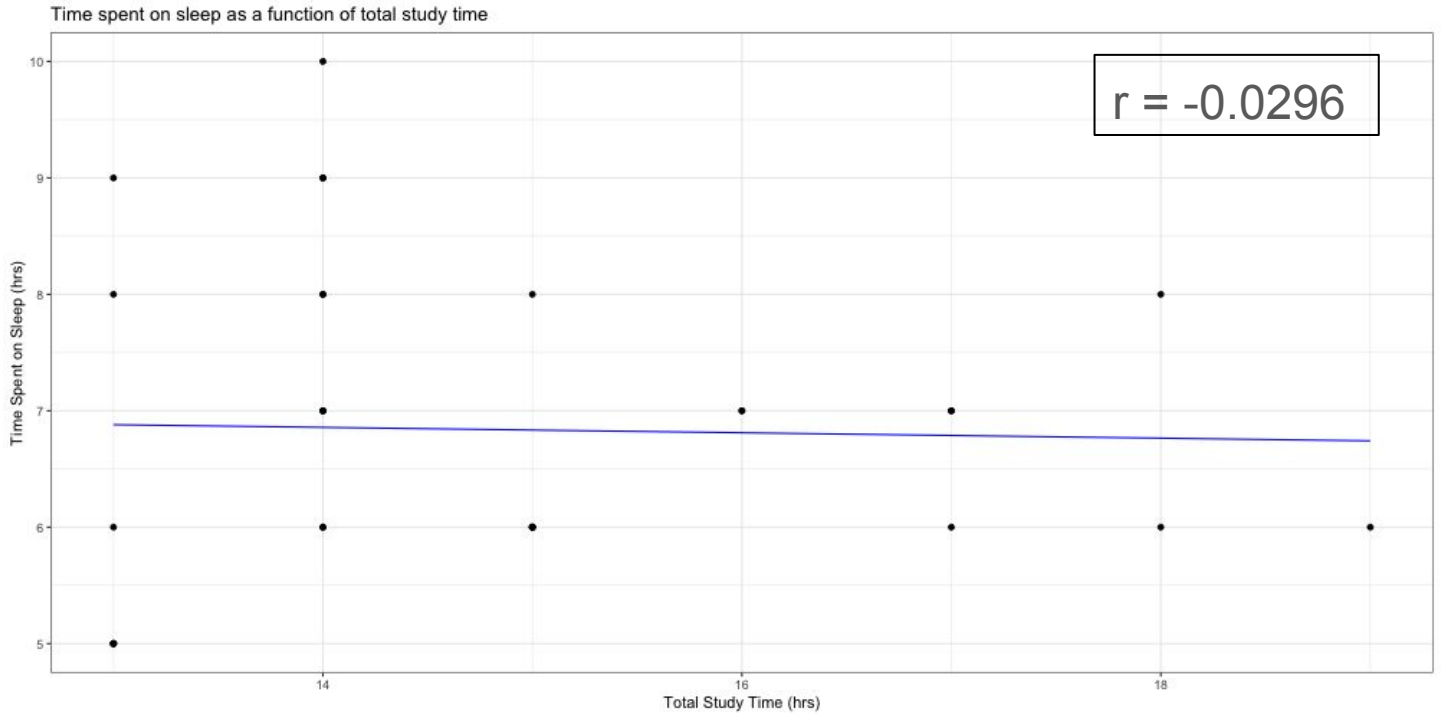
```
> cor(data$`Total Study Time`, data$`Time spent on fitness`)
[1] -0.002813374
```

Total Study Time and Sleep



The graph shows the relationship between total study time and time spent on sleep. There seems to be a weak negative relationship between the two variables. The correlation coefficient is -0.265, so there is a low correlation.

Exploring whether relationship is stronger on higher end



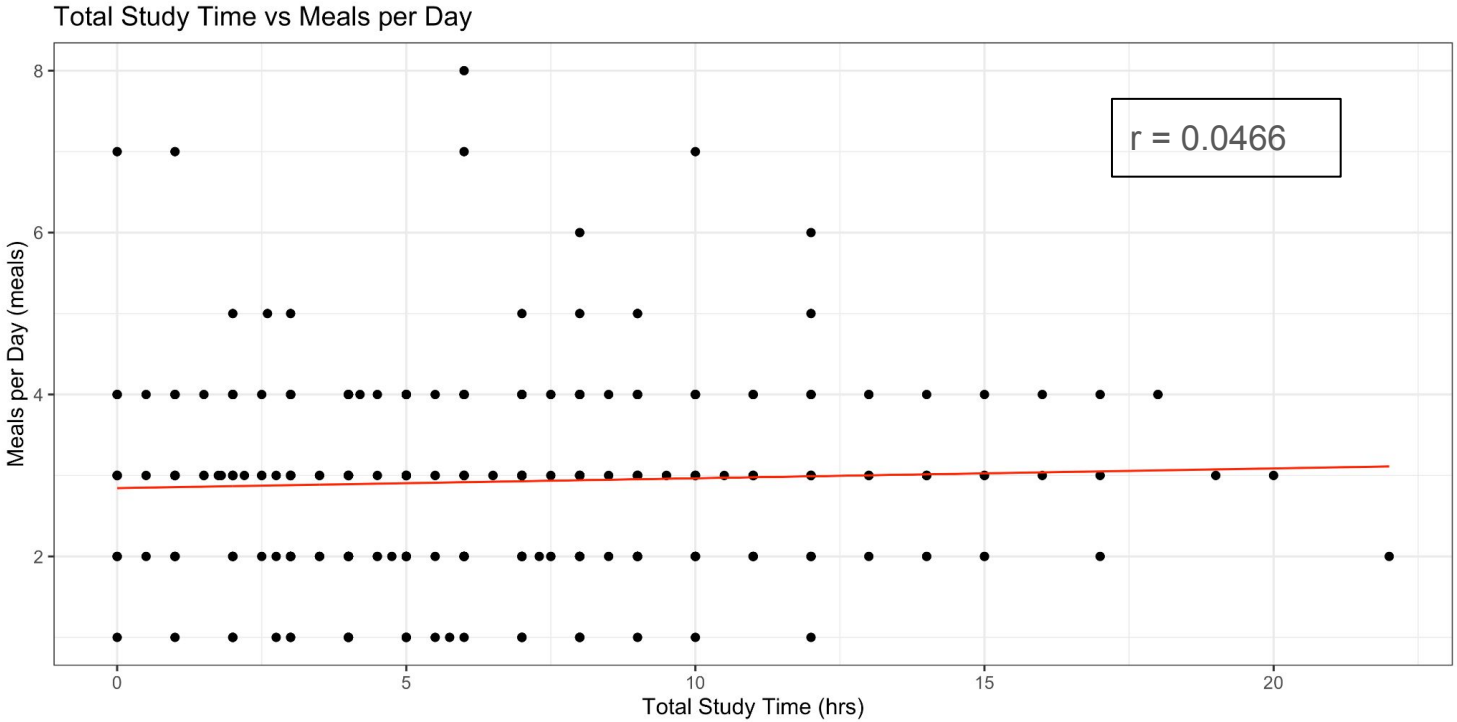
The graph shows the relationship between total study time and time spent on sleep, including only data points where total study time is greater than 12.5 hours and less than 20 hours. The relationship remains negative but becomes even weaker, with a correlation coefficient of -0.0296.

Conclusion about total study time and sleep

- Correlation coefficient of -0.265
- A slight negative relationship — as study time increases, sleep decreases — but very weak even when looking at only the higher values

```
> #calculate correlation coefficient
> cor(remote$Total.Study.Time, remote$Time.spent.on.sleep)
[1] -0.2651474
```

Total Study Time vs Number of Meals



Weak positive relationship between the variables with almost horizontal line of best fit
Correlation coefficient of 0.0466, low positive correlation

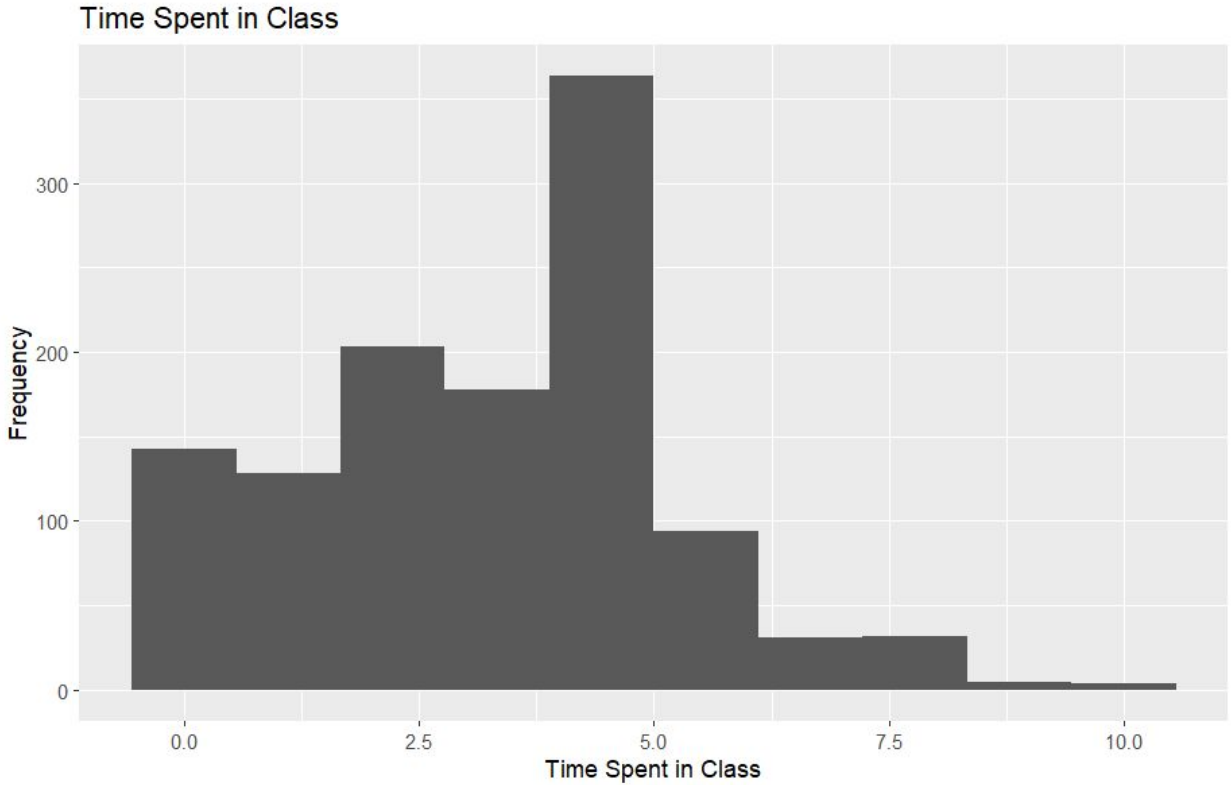
Conclusion about total study time and number of meals

- Correlation coefficient of 0.04661073
- A negligible positive relationship — as study time increases, number of meals stayed almost constant
- Studying time did not affect the number of meals

```
> cor(COVID$Total.Study.Time, COVID$Number.of.meals.per.day)
[1] 0.04661073
```

```
Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)      2.843448   0.052343  54.323   <2e-16 ***
Total.Study.Time 0.012170   0.007593   1.603    0.109
```

Do you find yourself more connected with you family, close friends, relatives?



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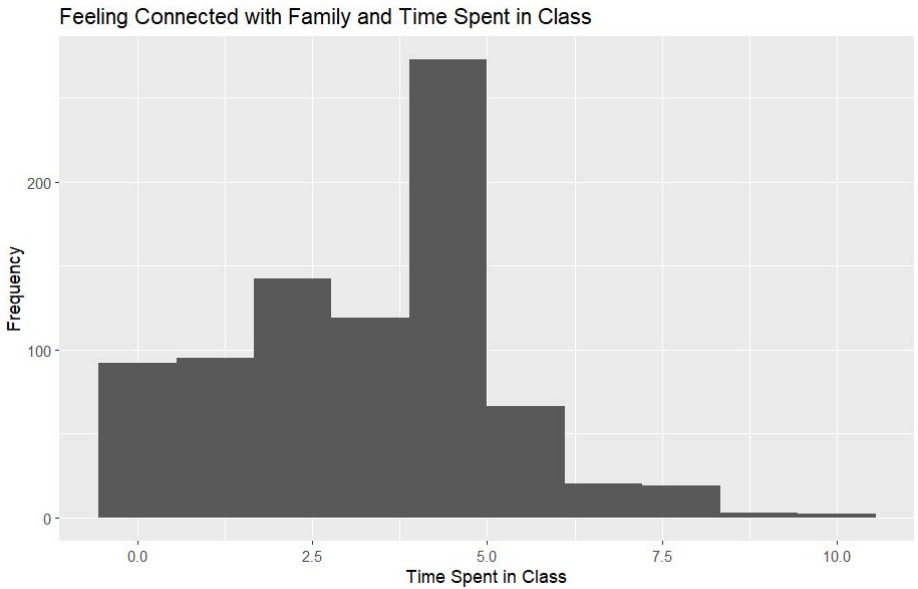
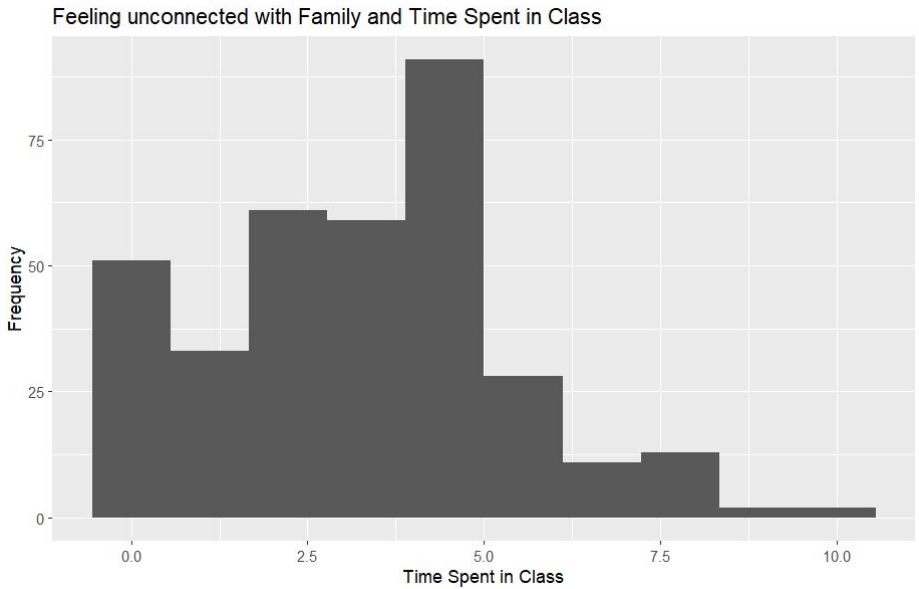




Conclusion

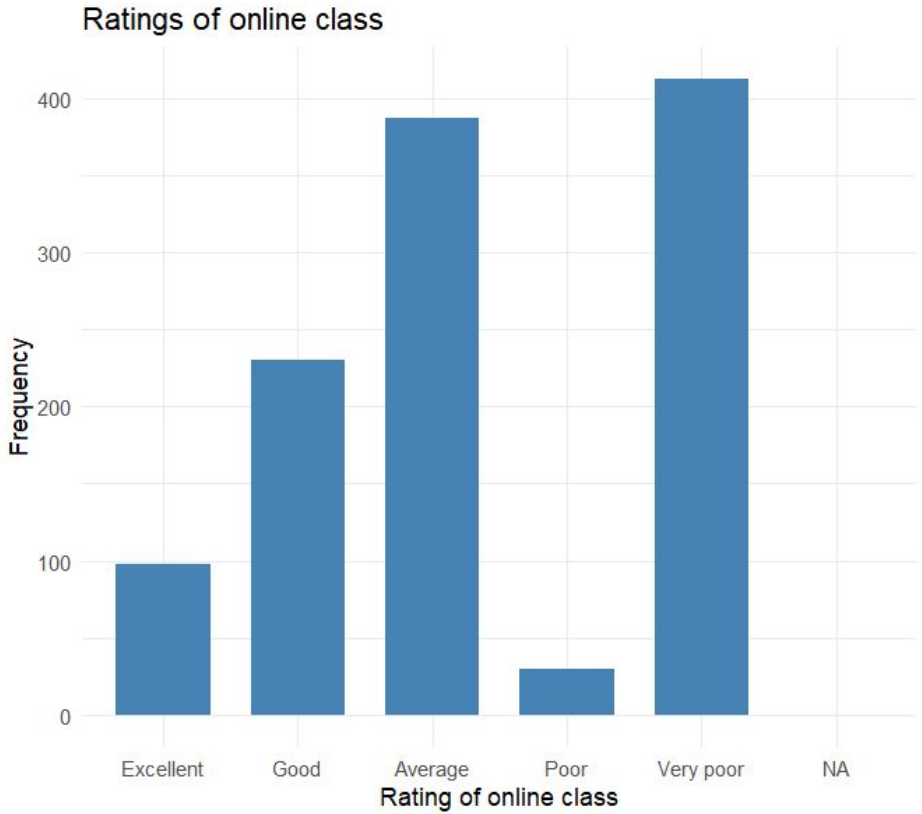
Hypothesis: Students that spend more time in class will feel less connected to others.

All three histograms appear almost identical.

A two-sample t-test yields a p-value of 0.84181

No statistically significant difference between the two groups.

Do you find yourself more connected with you family, close friends, relatives?



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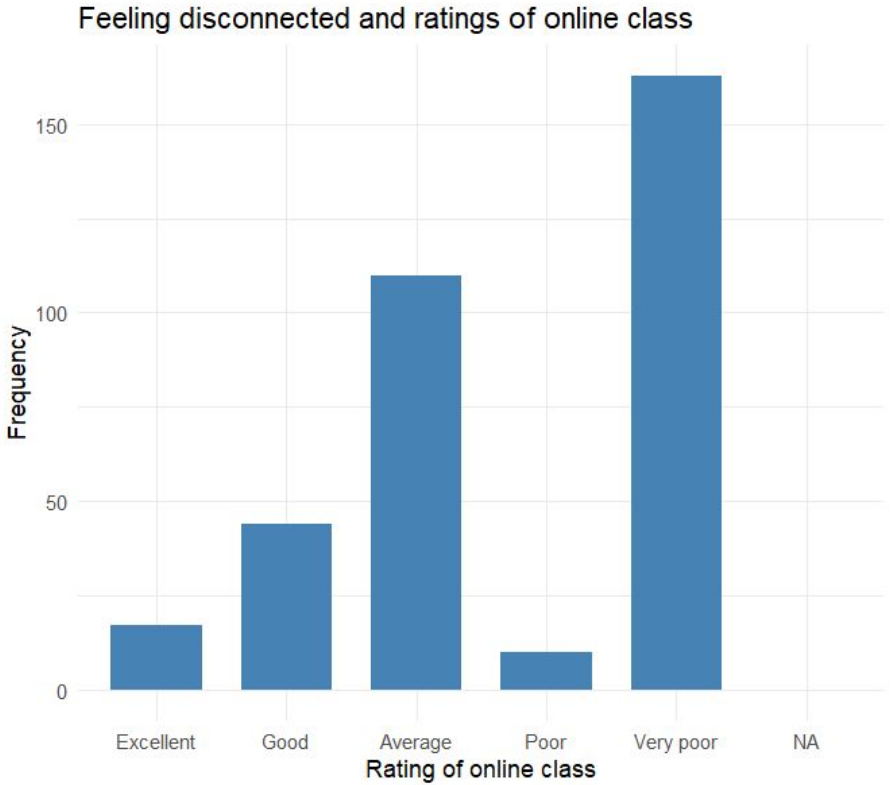

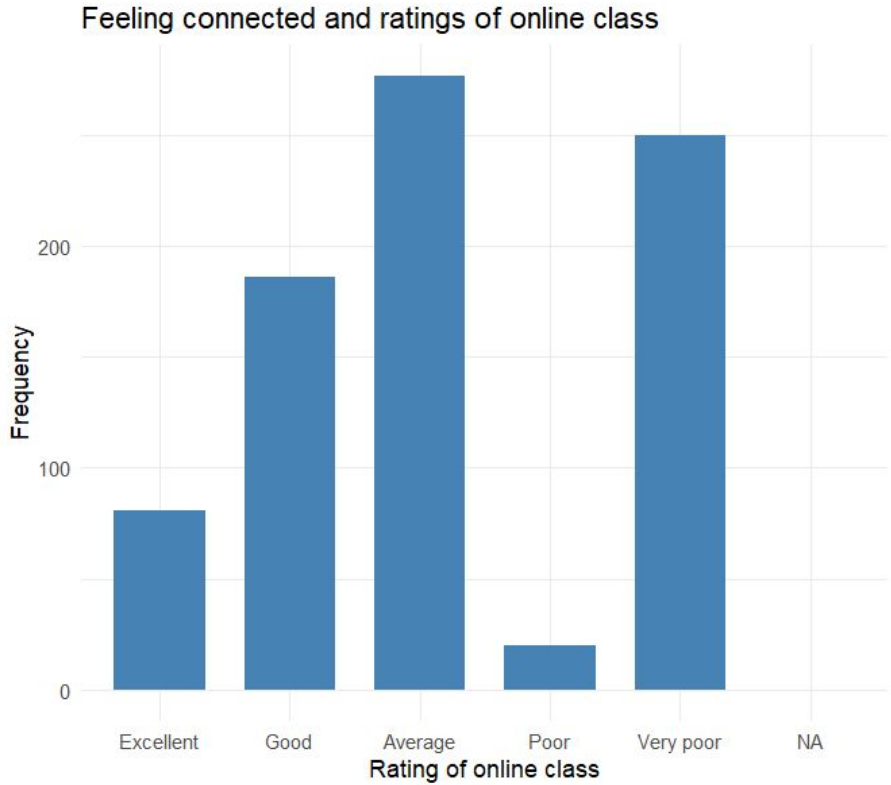

Conclusions

Hypothesis: Being more connected with family results in enjoying online classes more.

Those who feel connected to their families rate online classes more positively.

A chi-squared-test yields a p-value of 7.566e-08

There is a statistically significant difference between the two groups

General conclusion

- Overall weak relationships between variables, with the strongest relationship between total study time and time spent on sleep
- Feeling more connected with family does not impact amount of time spent in online classes, but does increase students' enjoyment of the classes.
- There is evidence of some relationship between time spent on remote learning and different indicators of well-being, but it is very weak; further research should be conducted in this area

Further questions

Our dataset was from India, how do other countries compare?

Does online learning correlate to a change in academic performance?

How do the other variables we studied correlate to academic performance?

Does online learning correlate to changes in mental health?

How would the results change if the study was done on a younger population?