

The effect of social media on mental health



December 19, 2025

Students:

Hero R. Brouwer
15170284

Mingtao Cheng
15163423

Maryelis Martinez Diaz
16482816

Ryan de Klerk

15008827

Group:

4

Lecturer:

Mr. R. Quax



Table of Contents

Project questions

 Main Question

 Sub-questions

Methods & Results

 Sub-question 1

 Sub-question 2

 Sub-question 3

 Sub-question 4

Conclusion



Main Question

How does social media usage relate to mental health across different age groups and countries?

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion



Motivations

- Mental health issues are a big problem.
- Helps us look at possible relations.
- Gives a start point for further research.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion



Sub-questions

Sub-questions related to a person's age:

- **Sub-question 1:** Age & social media usage
- **Sub-question 2:** Age & mental health issues

Sub-questions related to a person's country/continent:

- **Sub-question 3:** Social media exposure & mental health issues
- **Sub-question 4:** Social media uptake & mental health changes

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 1 - The question

Do certain age groups make more use of social media?

Hypothesis:

- *H0*: There is no pattern in the relation between age and social media usage.
- *H1*: Younger age groups on average make longer use of social media and use more platforms.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 1 - The question

Do certain age groups make more use of social media?

2 ways to observe this relation:

- The amount of time spent on social media.
- The amount and type of platforms used.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 1 - Methods

- Spearman correlation
 - Relation between age and social media time.
 - Gives a coefficient between -1 and 1.
- Chi-Square statistic
 - Platform usage differences between ages.
 - Difference between contingency table and independent data.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

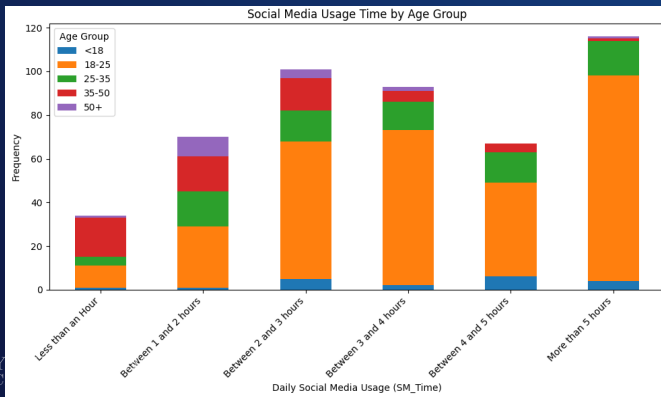
Sub-question 3

Sub-question 4

Conclusion

Method 1: Age vs. Daily social media time

- Younger age groups spend relatively much more time on social media than older age groups.
- Spearman correlation: **-0.267**



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

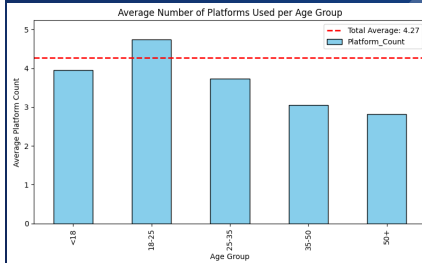
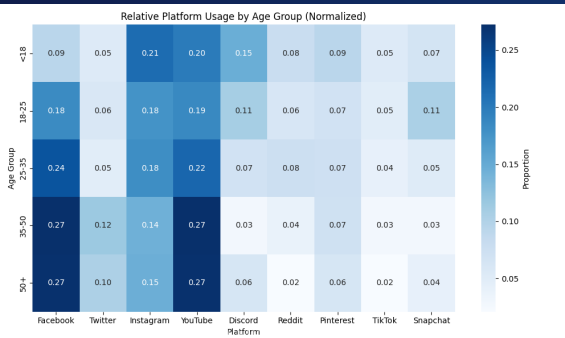
Sub-question 3

Sub-question 4

Conclusion

Method 2: Age vs. social media platform use

- Platform use is more diverse for younger age groups, while older age groups are more focused.
- Chi-Square Statistic **75.666**



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 1 - Conclusion

Results statistical tests:

- Spearman correlation: **-0.267**
- Chi-Square Statistic **75.666**
- p-value < **0.0001**

These results show that:

- Younger age groups use social media for longer times.
- Younger age groups use a more diverse range of platforms, and often multiple.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 2 - The question

Do certain age groups suffer more from mental health issues?

Hypothesis:

- H0: There is no pattern in the relation between age and mental health issues.
- H1: Certain age groups suffer on average more/less from mental health issues.

The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 2 - Data collection

Do certain age groups suffer more from mental health issues?

Data:

- List of mental health questions ranked 1-5.
- The score is the average score on those questions.

The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 2 - Methods

- Spearman correlation
 - Relation between age and mental health score.
 - Gives a coefficient between -1 and 1.
- Kruskal-Wallis H-test
 - Compares the distribution of mental health scores.
 - Gives a H-value indicating differences.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

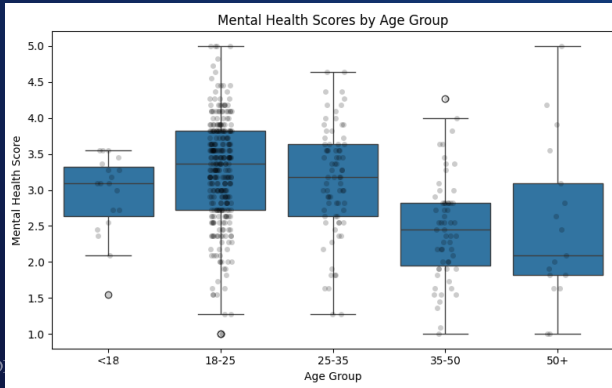
Sub-question 3

Sub-question 4

Conclusion

Age vs. Mental Health score

- The median score for younger age groups is much higher than for older age groups.
- Kruskal-Wallis H: **57.944**



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 2- Conclusion

Results statistical tests:

- Spearman correlation: **-0.220**
- Kruskal-Wallis H: **57.944**
- p-value < **0.0001**

These results show that:

- Younger age groups report on average higher mental health scores.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 3 - The question

- **Do countries/continents that have more exposure to social media suffer more from mental health issues?**

Hypothesis:

- H0: Countries/continents where social media is more often used, have relatively less cases of mental health issues.
- H1: Countries/continents where social media is more often used, also have relatively more cases of mental health issues.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 3

- **Do countries/continents that have more exposure to social media suffer more from mental health issues?**

We will look at 2 different cases:

- Country-level
- Continent-level

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 3 - Continents

Data:

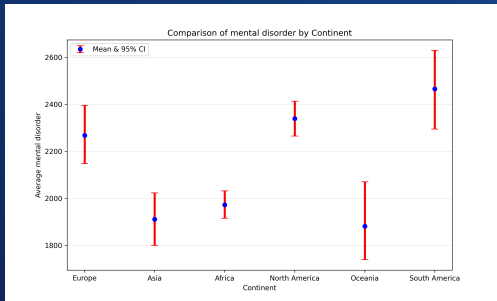
- Social media share (% of population)
- Mental disorder prevalence

Methods:

- Bootstrap: Estimate each continents mean and its 95% confidence interval.
- KS tests: Applied only to continent pairs whose confidence intervals overlap.

Continents - Mental disorder prevalence

- Europe, North America and South America: higher levels of mental disorder



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

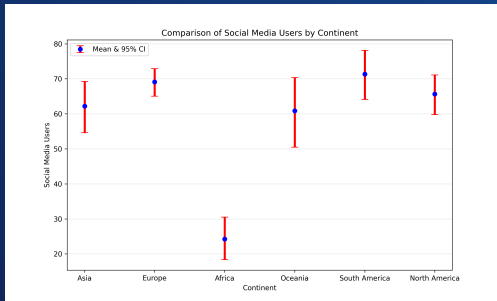
Sub-question 3

Sub-question 4

Conclusion

Continents - Social media usage

- Except for Africa, all continents have a high share of social media users.



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

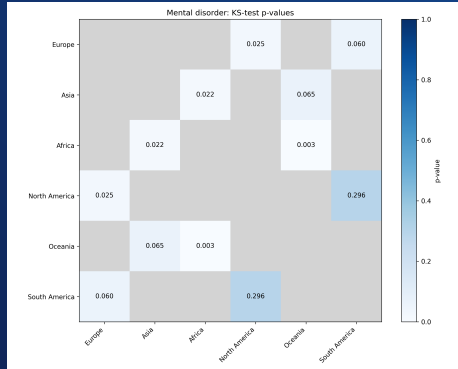
Sub-question 3

Sub-question 4

Conclusion

Continents - Results

- Mental disorders: Europe vs North America, Asia vs Africa, and Africa vs Oceania.



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

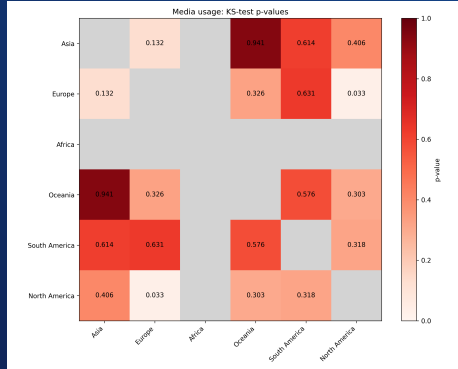
Sub-question 3

Sub-question 4

Conclusion

Continents - Results

- Social media usage: Europe vs North America.
- Mental health differs greatly by continent, but social media usage remains relatively consistent globally.



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 3 - Countries

Methods:

- Linear regression: Estimates the association.
- K-Means clustering: Groups countries.
- Spearman correlation: measures the strength of the association.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

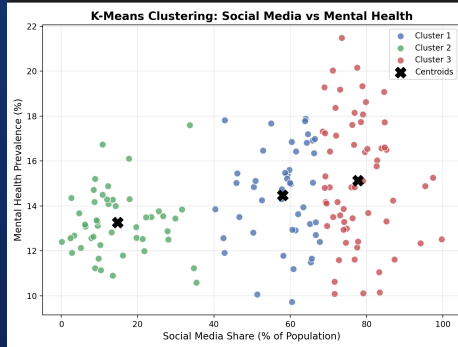
Sub-question 3

Sub-question 4

Conclusion

Countries - Results

- Mediumhigh exposure clusters show slightly higher average mental disorder prevalence.
- No strong evidence for a clear relationship.



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

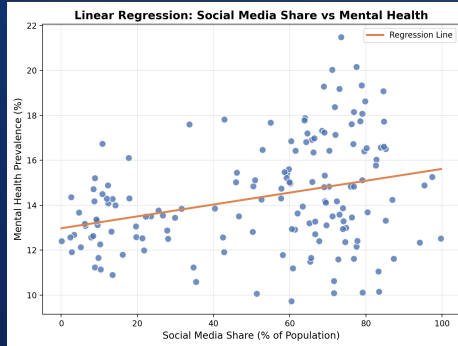
Sub-question 3

Sub-question 4

Conclusion

Countries - Results

- The regression line shows a slight positive relationship
- Spearman correlation = 0.277 indicates only a weak association.



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Sub-question 4

- **Do countries that have a faster uptake in social media users see a faster decline in mental health compared to slow-uptake countries?**
 - H0: There is no significant difference.
 - H1: Faster uptake in social media users \Rightarrow faster decline in mental health
 - * **Note:** Fast- and slow uptake countries are defined by the **median value**.

Sub-question 4 - Methods

- Mann-Whitney U test with Z-score
 - Rank mental health changes
 - If $|z| > \text{critical value}$, reject H_0
 - Critical value = 1.96 for $\alpha = 0.05$

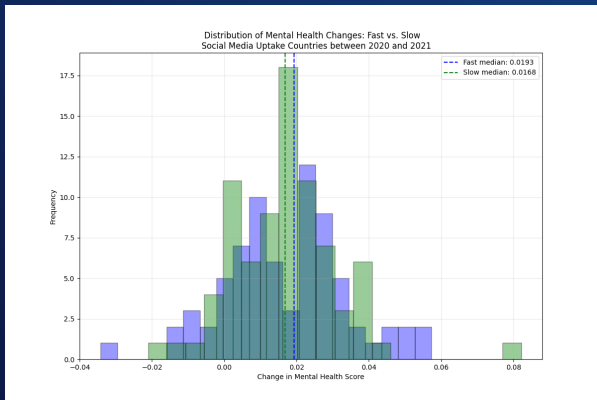
$$U_f = n_f n_s \frac{n_f(n_f + 1)}{2} - R_f$$

$$U_s = n_f n_s + \frac{n_s(n_s + 1)}{2} - R_s$$

$$z = \frac{\min(U_f, U_s) - \mu_{U_{f,s}}}{\sigma_{U_{f,s}}}$$

Sub-question 4: Results

- $|z| = 0.52 \leq 1.96 \Rightarrow$ Fail to reject H_0



The effect of social media on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Conclusion

How does social media usage relate to mental health across different age groups and countries?

Results of sub-questions:

- Sub-questions 1 and 2: A person's age does seem to have an effect on the social media usage, and their mental health.
- Sub-questions 3 and 4: The exposure and uptake of social media in a country, does not seem to have a major effect on the mental health of a person.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion



Conclusion

How does social media usage relate to mental health across different age groups and countries?

Final conclusion:

The relation between social media and mental health, seems to be impacted by personal factors, such as age, but not as much by regional factors like a person's place of origin.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

Future research

- Larger datasets
- Avoid missing 'important' countries.
- Better age distribution.
- More focus on individuals. (*ecological fallacy*)
- Experiment with other personal factors.

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion



Thanks for listening, any questions?

The effect of social media
on mental health

Project questions

Main Question

Sub-questions

Methods & Results

Sub-question 1

Sub-question 2

Sub-question 3

Sub-question 4

Conclusion

