Remote Work On Mental Health

By
Robert Solomon

Supervised By
Dr. Vinayak Deshpande

Introduction

Research Topic: Investigating the Impact of Remote Work on Mental Health using Data Science Approaches.

The shift to remote work has been accelerated due to global events like COVID-19.

This project aims to explore both qualitative and quantitative data to understand the mental health implications.

Research Questions

1. How does remote work influence mental health indicators such as stress, isolation, and burnout?

2. Is there a statistically significant correlation between remote work and reported anxiety levels?

3. Can a predictive model be built to assess risk factors of poor mental health outcomes in remote settings?

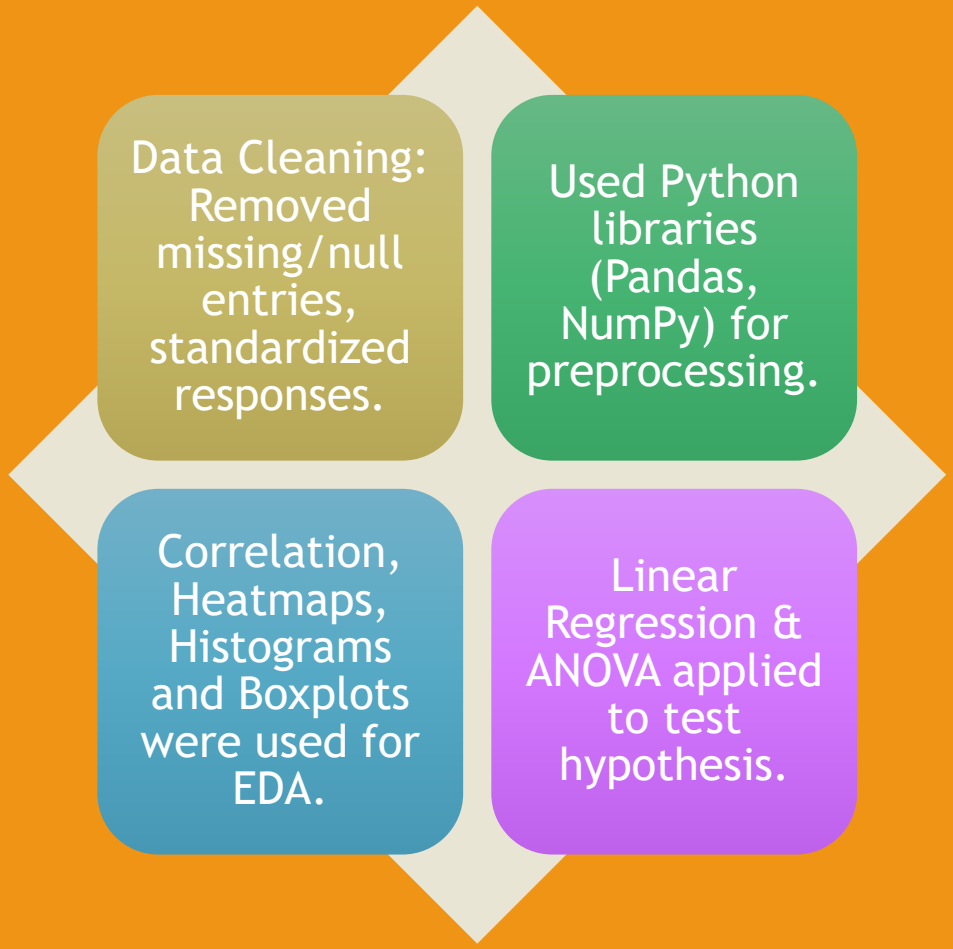
Methodology

Primary data collection using online surveys distributed to remote/hybrid and onsite workers.

Secondary dataset sourced from publicly available mental health research databases. (Kaggle)

Statistical tools and techniques used: correlation analysis, regression modeling, and ANOVA testing.

Data Preprocessing & Analysis



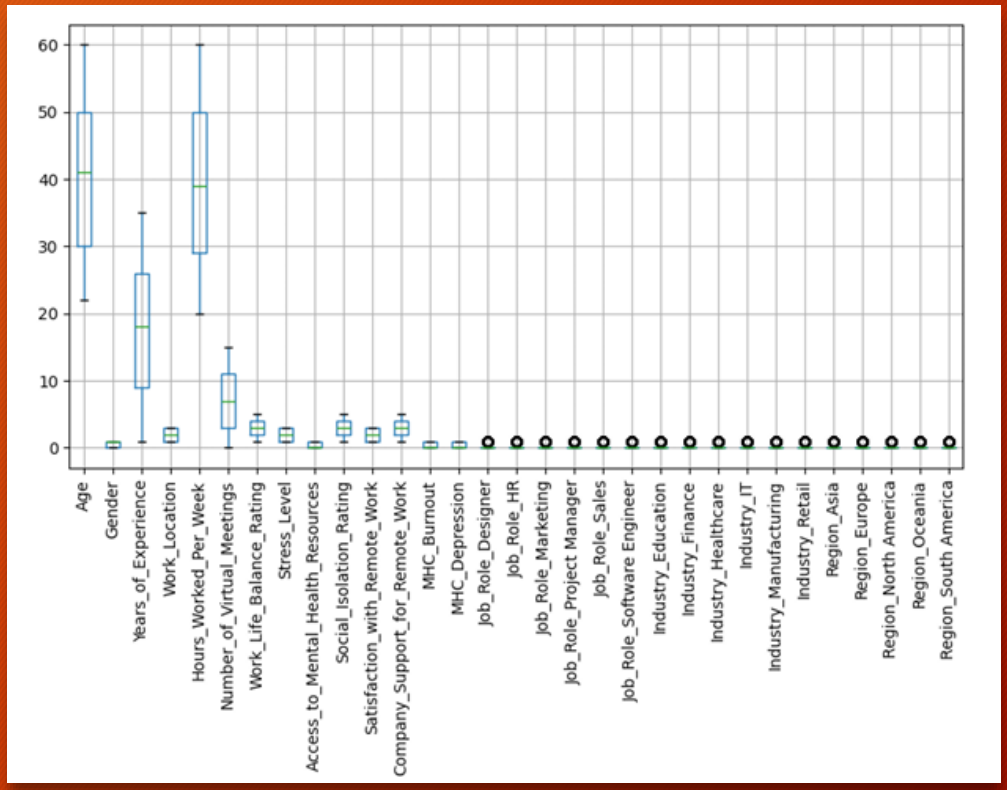
Data Preprocessing & Analysis for Primary Data

- Snapshot of Primary Dataset (Survey) highlighting incomplete survey responses (missing data shown in green).

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Timestam	Q1: What	Q2: What	Q3: What	Q4: What	Q5: On a s	Q6: How n	Q7: On a s	Q8: What	Q9: How o	Q10: Do yo	Q11: Does	Q12: What changes would you recommend to improve mental health support for remote workers? (C								
2025/01/2	25â€“34	Male	Hybrid	IT/Techno	4	35	2	Isolation f	Always	Yes	No	Stop remote work and have people come into the office								
2025/01/2	25â€“34	Male	Remote	IT/Techno	5	40	2	Lack of cla	Never	No	Yes									
2025/01/2	35â€“44	Male	Remote	IT/Techno	5	39	1	Other (ple	Sometime	No	Unsure	Regional hot desk options at some of the many co working spaces								
2025/01/2	45â€“54	Male	Remote	IT/Techno	5	39	3	On call ov	Sometime	No	Unsure	Occasional lunchtime meetups if enough people are amenable to that								
2025/01/2	35â€“44	Female	Remote	IT/Techno	2	9	5	Increased	Often	No	Unsure	Add remote workers team lead to identify possible challenges								
2025/01/2	35â€“44	Male	Remote	IT/Techno	3	40	4	Difficulty r	Often	No	Yes	More clarity on availability/real world examples of use cases for the support.								
2025/01/2	45â€“54	Female	Hybrid	IT/Techno	4	40	3	Other (ple	Never	No	Yes	I use my camera every day for all meetings - it helps you to feel connected and it helps your colleagu								
2025/01/2	45â€“54	Female	Remote	IT/Techno	4	38	3	Often worl	Rarely	No	Yes	It's good to have one or two colleagues you get on with as friends to be able to share what the week v								
2025/01/2	25â€“34	Male	Remote	IT/Techno	5	40	1	None	Never	No	No									
2025/01/2	45â€“54	Female	Hybrid	IT/Techno	3	39 hours	3	Isolation f	Sometime	Yes	Yes	Regular huddles/meetings. If possible onsite meetings or social gatherings, even if these are only ev								
2025/01/2	35â€“44	Female	Remote	IT/Techno	3	45	4	Isolation f	Sometime	Yes	Yes									
2025/01/2	18â€“24	Male	Remote	IT/Techno	4	40	4	Isolation f	Often	Yes	Unsure	More accessible mental health care routines								
2025/01/2	45â€“54	Male	Remote	IT/Techno	4	38	2	isloation f	Often	Yes	Unsure	Guide for how to best cope with it (although most people know already)								
2025/01/2	55+	Male	Hybrid	IT/Techno	3	40	3	Increased	Rarely	Yes	Unsure	Encourage return to office								
2025/01/2	45â€“54	Male	Remote	IT/Techno	4	48	2	Isolation f	Rarely	No	Yes									
2025/01/2	25â€“34	Male	Remote	IT/Techno	4	39	3	Increased	Never	No	Yes	More (optional) team building activities in person. It seems since going remote, and transitioning to								
2025/01/2	25â€“34	Male	Remote	IT/Techno	2	10hrs	4	Isolation f	Often	Yes	No	In-person on-site events once in 6 months; Access to WeWork for those who are interested in hybrid								
2025/01/2	25â€“34	Male	Remote	IT/Techno	4	39	3	Increased	Often	No	Unsure	Lowering								
2025/01/2	35â€“44	Female	On-site	IT/Techno	3	40	3	Increased	Rarely	No	Yes	Team/All hands type of meetings not just to enquire any daily work status and results but to connect								
2025/01/2	35â€“44	Female	Remote	IT/Techno	4	39	4	Increased	Often	Yes	Yes									

Data Preprocessing & Analysis for Secondary Data

- Secondary dataset sourced from publicly available mental health records
- Outlier detection applied across numeric variables
  - Notable outliers in:
  - Age
  - Years of experience
  - Virtual meetings per week
  - Hours worked per week
- Preprocessed for ANOVA & regression modeling



Primary & Secondary Analysis & Findings

Key findings from primary data

Key findings from secondary data

Secondary Analysis & Findings

Key findings showed a moderate negative correlation between number of hours worked remotely and social connectedness.

Regression indicated that age and workload were significant predictors of mental health score.

Key Findings - Secondary Data

Strong positive link between work stress and weekly hours (r ≈ 0.92)

➔ Long hours likely drive higher stress levels

Negative correlation between stress and mental health service access

➔Better access = lower stress

Weak/no clear correlation between stress and age, gender, or experience

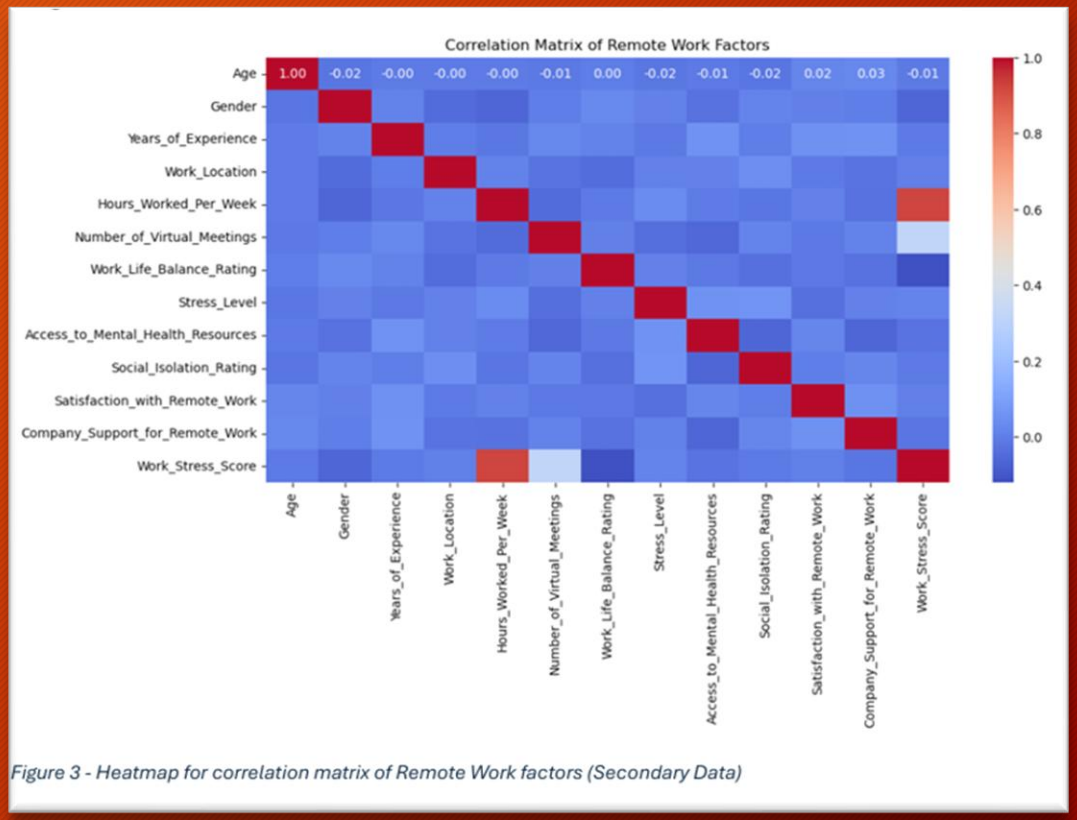


Figure 3 - Heatmap for correlation matrix of Remote Work factors (Secondary Data)

Key Findings – Primary Data

Work-Life Balance vs. Stress Level	➔ Moderate negative correlation (r = -0.55)→ Better balance = lower stress
Social Isolation also negatively linked to stress	➔ Frequent isolation = higher stress
Employer Support showed weak to moderate negative correlation with stress	➔ Support may help reduce stress
Stress Score strongly correlated with Stress Level (r = 0.88)	➔ Confirms stress score as a valid measure

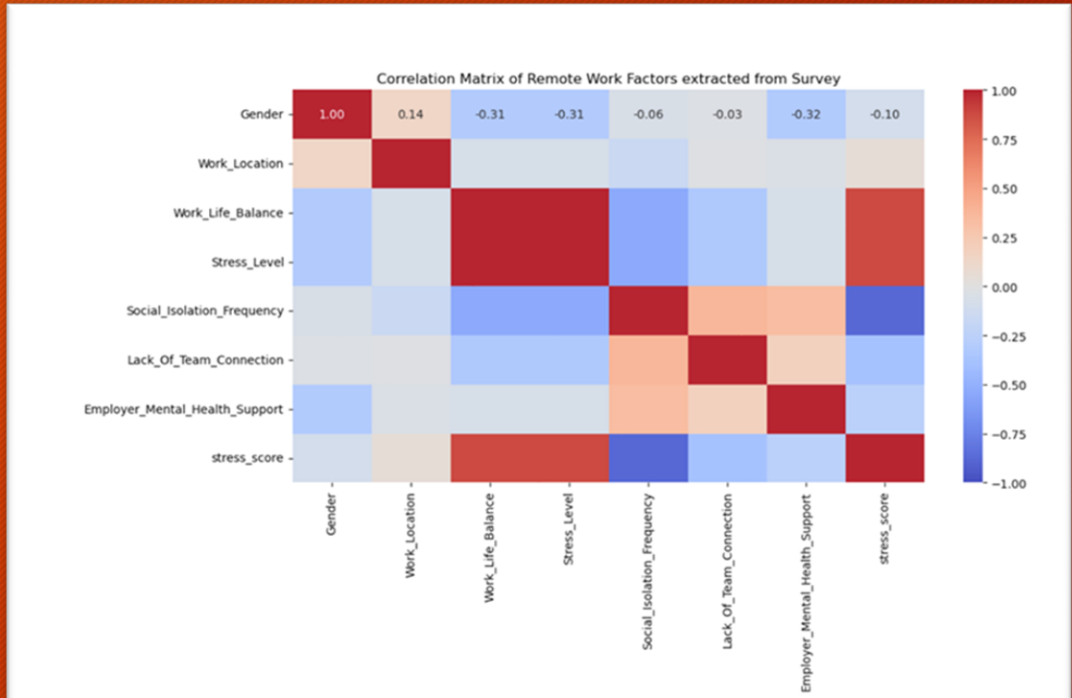


Figure 8 - Heatmap for correlation matrix of Remote Work factors extracted from survey (Primary Data)

Model Comparisons for Secondary Dataset

	Model	Score_Type	Score_Value
0	OLS Regression	R-squared	0.0060
1	Binary Logistic Regression	Pseudo R-squared	0.0001
2	Decision Tree	Accuracy	0.5860
3	Random Forest	Accuracy	0.6250

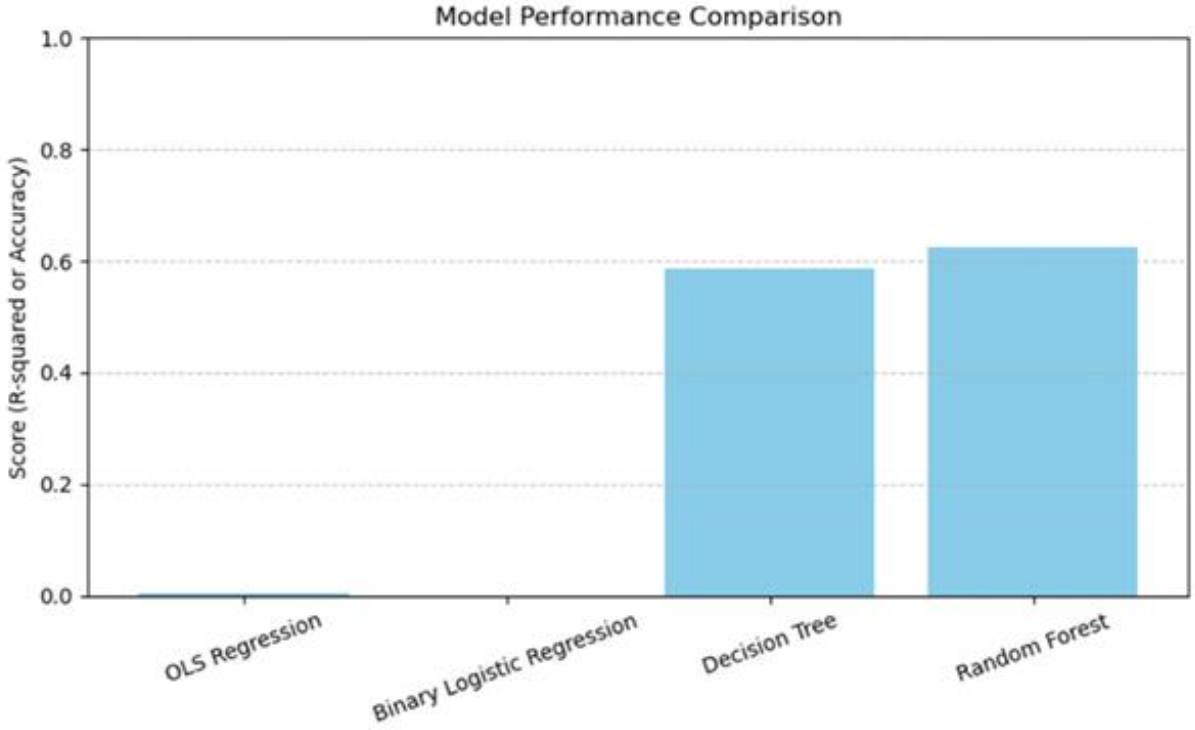


Figure 6 - Bar chart of Model Comparisons (Secondary Data)

Model Comparisons for Secondary Dataset

Discussion

- Interpretation of results

- Comparison with existing literature

- Implications

Discussion -- Conclusion & Recommendations

Conclusion: Remote work presents both risks and benefits, flexibility vs. isolation.

Recommendations: Employers should foster community and encourage regular check-ins.

Self-Reflection & Challenges

Challenge: Planning and executing primary data collection required persistence and adaptability.

Data preprocessing for secondary data was time-intensive due to inconsistencies and noise.

Lessons learned: Importance of version control (used GitHub privately), and documenting all preprocessing steps clearly.

My Github: Robert-Solomon12

Future Work

- Recommendations for future research

- Improvements and extensions

Thank You!

OPEN TO QUESTIONS?

CONTACT INFORMATION

Linkedin: https://www.linkedin.com/in/robertosolomon/

GITHUB: https://github.com/robert-solomon12