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A Survey-Based Approach to Study / Work from Home Opinions During Covid-19 Pandemic

Kailash Subramanian
Student, School of Computing Science and Engineering
Vellore Institute of Technology, Chennai, Tamil Nadu, India

Abstract: *The COVID-19 pandemic has thrown our lives out of gear, causing sweeping changes to nearly all aspects of human society. The shift from working or studying from a workplace (offices, colleges and schools) to WFH (Work From Home) or SFH (Study From Home), has been the most prominent change. To study the impacts of this change further, a questionnaire form consisting of 10 questions was circulated, in which 42 people across various age groups participated. Data analysis and visualisation of the collected data was done with the aim of answering the following research questions - whether there was a change in screen time before and during the pandemic, and whether there was any relation between number of vaccine doses taken and people's decision to return to their workplaces. This study concludes that there was a marked increase in screen time for most people by an average of 2.7 hours. It also discovers that there is a mild positive correlation between the number of vaccination doses taken, and people's decision to return to their workplaces.*

Keywords: COVID19, Data analytics, Questionnaire, Vaccination, Work from home

I. INTRODUCTION

The Covid-19 pandemic has changed the very way the world works. Due to the virulent and easily transmissible nature of the virus, people have been facing stay-at-home orders for more than a year. The pandemic has forced people to shift from office-based working / school-based study to remote work / study, leading to massive screen time fluctuations, disturbed and irregular sleep patterns for many individuals. It has also given a host of mental health issues to people, as taking care of a full-time job, kids and a family can become stressful when done in such dire circumstances. People have struggled to home-school their kids, and juggle their jobs while also co-existing with their spouses and/or parents. However, since the beginning of 2021, people have had many reasons for cheer, as vaccination rates have improved significantly, thanks to development of modern vaccine R&D and production methods [1] and a significant portion of the people are heading back to their campuses. Many patterns are being followed according to the business needs; some institutions offer fully remote options, while some management and institutional authorities are asking people to attend class or office in a staggered pattern, or in multiple shifts in a week. In this study, a questionnaire-based survey was conducted, in which 42 people from colleges and offices participated, from the Indian subcontinent. It was conducted with an aim of answering the following research questions using data analytics techniques -

- Is there any relation between the rates of vaccination and the willingness of people to come back to their workplaces (be it school / college / office) ?
- Is there any change in the screen time before and after the pandemic ?

Vaccination rates have improved significantly in the world, with at least 51.4% of the world's population having received a single dose, and almost 40% of the people [2] having received both doses of a WHO approved vaccine . This has led to an increase in the number of people going back to their offices / educational institutions. However, some people are still reluctant to head back to their campus; this study is an attempt to check if people's vaccination status is in any way linked to their decision to work / study from home. Moreover, since staying at home has led to an increase in screen time for most people, this analysis also attempts to check by how much people's screen time has increased after work from home started. These two are the primary research questions which are to be answered through the

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analysis. The language used for the analysis is Python, running on Windows OS. Visual Studio Code was used as the IDE, along with appropriate libraries such as Pandas, Numpy, Sci-kit Learn. Matplotlib and Seaborn were used for visualisation.

II. Data Exploration

2.1 Questionnaire Details

The study was conducted using Google Forms, in which 42 people participated. For purposes of privacy, their eMail IDs were dropped before performing data analysis; numbers ranging from 0 to 41 were assigned to each person, thereby assuring them of complete anonymity. The following questions were asked, with their corresponding options presented-

- Age ?
  - 10-20
  - 20-30
  - 30-40
  - 40+
- What is your current occupation?
  - Student
  - Working Professional
- Did you work/study from home before the pandemic ?
  - Yes
  - No
- Are you enjoying working/studying at home, during the pandemic ?
  - Yes
  - Neutral
  - No
- How many hours of time did you spend on screens during the pandemic ?
  - 0-2 hours
  - 2-4hours
  - 4-6 hours
  - 6-8 hours
  - 8+ hours
- How many hours of time did you spend on screens before the pandemic ?
  - 0-2 hours
  - 2-4hours
  - 4-6 hours
  - 6-8 hours
  - 8+ hours
- Are you vaccinated ?
  - First dose done
  - Both doses done
  - Not yet

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- Are you comfortable returning to your places of work/study after they reopen ?
  - Yes
  - No

- In the post-pandemic world, which mode of work/study will you prefer?
  - Fully in-person
  - Hybrid and Flexible
  - Fully Remote

2.2 Exploratory Data Analysis

In this section, let us look into the data exploratory analysis done:

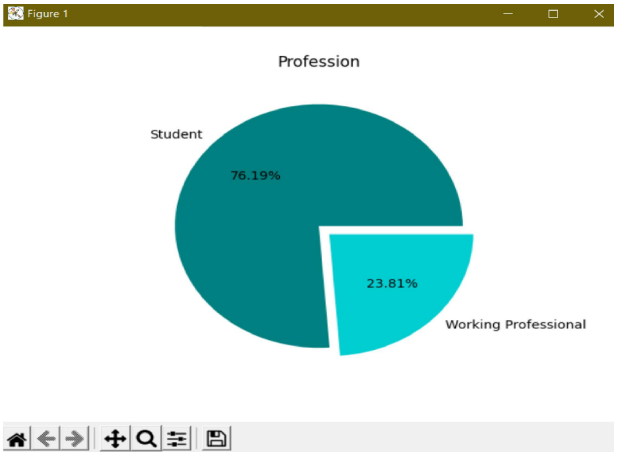

Figure 1: 76.19% of the population surveyed were students, with 23.81% being working professionals.

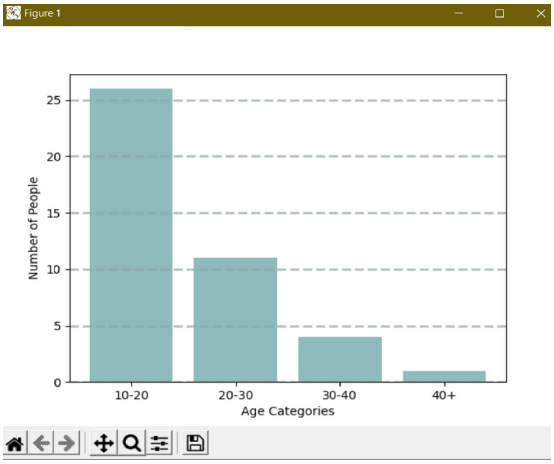

Figure 2: Age categories vs. Number of people is shown in the graph above. Majority of the people who participated in this survey (close to 26 people) belonged to the 10-20 category. The next largest category is 20-30, with roughly 11 people in this category.

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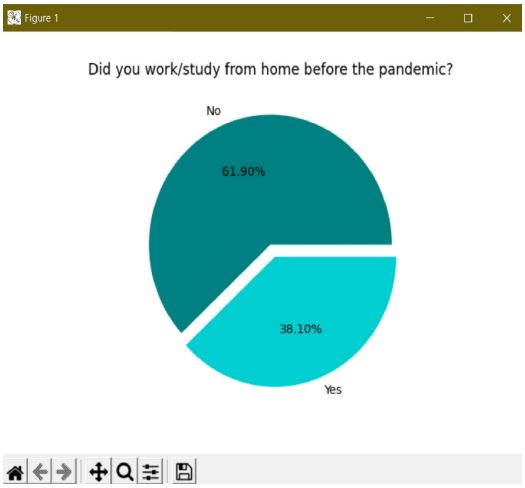

Figure 3: 61.90% of people have not worked from home before the pandemic, with 38.10% of them having worked from home before the pandemic.

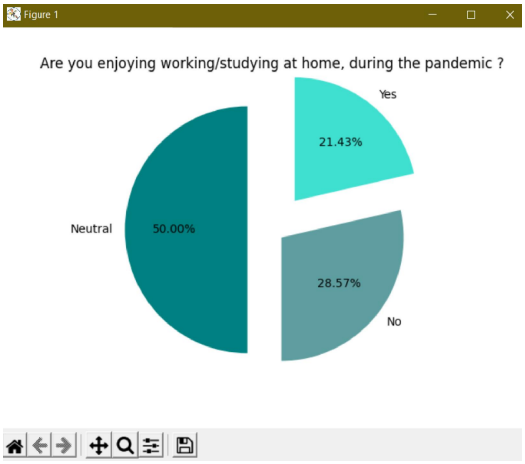

Figure 4: Half of the participants are neutral about studying / working from home, while 21.4% of people enjoy it. The rest of them do not like studying / working from home.

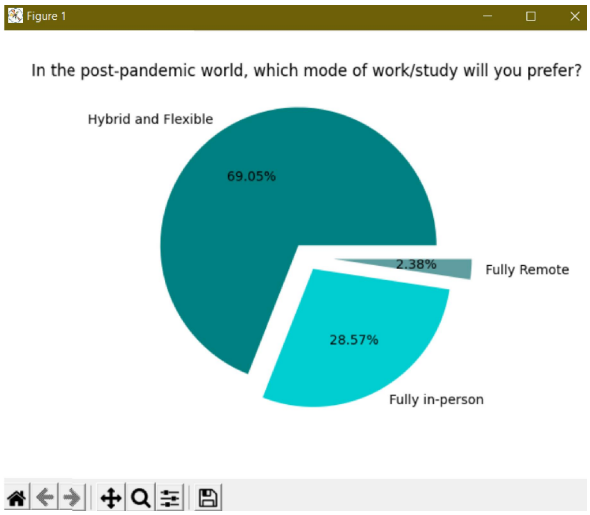

Figure 5: 69.05% of people prefer working in a hybrid and flexible manner in a post pandemic world, while a significant portion (28.57%) want in-person full time. The others (2.36%) want a fully-remote option.

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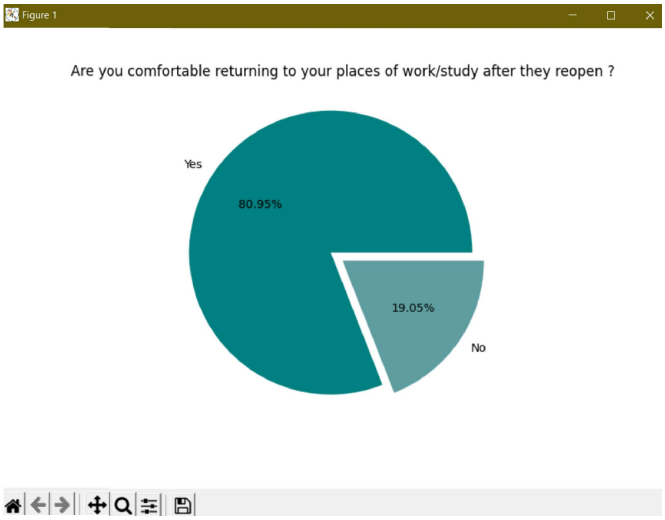

Figure 6: A vast majority (80.95%) of the respondents are comfortable in returning to the workplace, while the others (19.05%) aren't.

III. Literature Review

Authors of [3] aimed to investigate the link between the increase in teleworking of Nigerian employees and stress levels. Their demographic data was correlated using Pearson coefficient and their studies concluded that regular remote working led to increased stress levels. On the same note, occasional teleworking had no strong correlation with rise in stress levels. They made recommendations for areas of future studies as well.

In [4], the authors found out factors that influenced the productivity of professors during the WFH mode. They surveyed 15 faculties from East Java region, Indonesia. Their studies highlight the importance of digital orientation for staff selection criteria, so universities can offer flexible classroom modes for both students and their professors.

In a contingent assessment of Covid-19 vaccine conducted by authors of [5], they surveyed 566 individuals to check how many people would be willing to pay for a Covid-19 vaccine, and how many of them would be able to afford it, and they concluded that the adaptation to working under quarantine would affect the probability of the people paying.

The authors of [6] aimed to analyse the sentiment towards work from home, using a Twitter sentiment analysis approach. They extracted 100,000 tweets and analysed them. They arrived at the results that work from home was a positive experience for an overwhelming number of people, with most of the tweets having a sentiment of trust and anticipation.

In [7], authors aimed to document the progression of work from home, which was induced due to the pandemic. Using their observations, they found that transition to work from home model was more coherent with the permanent changes associated with work occupation response to a greater health risk. They found that more workers expect work from home to continue into the future.

IV. Answering The Research Questions

Research Question 1 - Is there a relation between vaccination rates and willingness of people to return to their campuses?

We consider two questions for this scenario - whether people are vaccinated and whether they are comfortable in returning to their workplaces. A linear regression to this question was performed, with replacing 0 for not yet vaccinated, 1 for one dose done and 2 for both the doses of vaccination completed; for comfortableness in returning, 1 was assigned to yes and 0 was assigned to no. The linear regression scatter plot is shown below -

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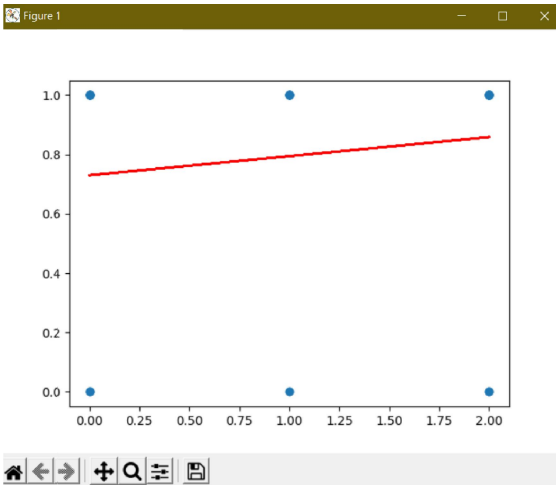

Figure 7: Linear Regression Plot of vaccination doses vs comfort levels of returning to their workplaces

We can see that there is a mild positive slope between the number of doses administered and their willingness to return to campuses. Also, the slope and coefficient values are given below, along with Pearson correlation coefficient -

```
Coefficient of Linear Determination:  0.018914318138831043
Intercept:  0.729903536977492
Slope:  [0.06430868]
[[1.         0.13752934]
 [0.13752934 1.        ]]
PS C:\Users\thegt>
```

Figure 8: Linear Determination coefficient, Intercept and Slope values of the linear model.

We can see that the slope, though gentle, has a positive explanatory relation with regards to the number of vaccination doses and their comfort levels in returning to their workplace. The Pearson correlation coefficient is a mild positive one, which is in line with linear regression.

Research question no 2 - Has pandemic led to increase in screen times?

On performing a barplot as shown in below figure, we can see that screen time has drastically *increased* for most individuals. Though options were given as range, they were imputed by their median values (1,3,5,7,8) for easy visualisation.

If the screen time has increased, the difference between 'during' and 'before' must be positive or zero. If it is negative, it implies that the screen time has reduced. On performing a mathematical analysis, it is seen that the screen time has increased / stayed the same for most people.

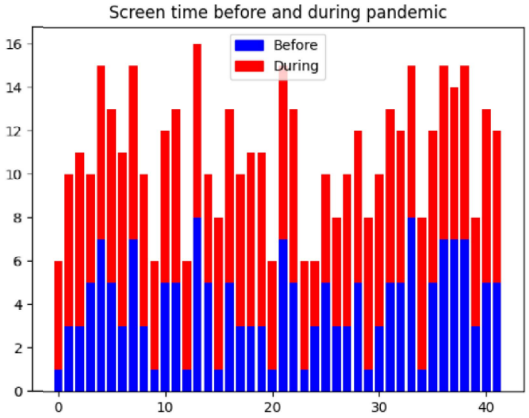

Figure 9: Screen time - before the pandemic (depicted in blue) vs during the pandemic (depicted in red)

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[4, 4, 5, 0, 1, 3, 5, 1, 4, 4, 2, 3, 4, 0, 0, 6, 3, 4, 5, 5, 4, 1, 3, 4, 0, 0, 2, 4, 2, 6, 4,
3, 2, -1, 6, 2, 1, 0, 1, 2, 3, 2]
41 1
```

Figure 10: There are 41 positive values and 1 negative value; screen time has reduced for only one person during the pandemic, out of the surveyed people.

V. CONCLUSION

We have got answers to the research questions proposed, and we can state with confidence that there is a slightly positive correlation between the number of doses of vaccine people have taken and returning to their workplace, and there is a drastic increase in screen time for most people, with an average increase of 2.7 hours. The vast majority of the respondents (80.5%) are also comfortable with returning to their workplaces, such as schools, offices and colleges post vaccination.

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BIOGRAPHY

Kailash is a 4th year student pursuing M.Tech. (Int 5yrs) Software Engineering from VIT University, Chennai Campus. His interests lie in the area of artificial intelligence, data science, machine learning and visualisation. He has good development skills and an analytical mindset that allows him to observe patterns from data. His interest in art and storytelling, through which he can creatively communicate about conclusion extracted from the data. He has done additional relevant coursework from NASSCOM and online MOOCs from Johns Hopkins University. He can be contacted at - thegta27@gmail.com