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## Remote work: A statistical analysis to understand the new normal

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**Abstract**--The pandemic situation has been an unprecedented experience for the world. As of March 2021, India is third among the most affected countries due to the novel Coronavirus (COVID-19). After a screeching halt, people have returned to their daily routines with a new shift in their working style. Telecommuting, commonly known as 'work from home' or 'working remotely', has become a new practice for many. The Information Technology and the education sector being the dominant fields of the service sector, march towards this practice of remote working. This research aims to understand whether people from Information Technology and education field are accustomed to the transition from the workplace to remote work. The article mainly focuses on studying three main aspects of life: Professional, Personal and Social. A study was conducted by circulating questionnaires among one hundred and ten employees of the Information Technology and the education sector. The data is analyzed using the statistical methods executed on R studio, an integrated development environment for R and visualization tools. The statistical analysis of the paper helps us to figure out whether the individuals are finding it comfortable or challenging to work from home.

**Keywords**--coronavirus (COVID-19), education, information technology, telecommuting, work from home (WFH).

## Introduction

These days, every person is striving to strike a perfect balance between work and personal life. It has become an increasingly enveloping concern for employers as well as employees. It was after World War II that people started focusing on work-life balance. That era witnessed a rise of female employees who had to look after their job and family simultaneously. The government also introduced the facilities like health and life insurance, pension plans and child care (Jennifer L. Glass, 1997). Today, it has become the utmost priority of every company to consider the wellness of its employees in all spheres of life. The 21st century has witnessed technology at its peak giving birth to the most important and widely used inventions. The rapid spread of Information Technology with the advancements in the telecommunication field has resulted in large-scale delocalization of work where people work away from their offices and conventional workplaces (Mitter, 2000). The practice of distance working gained high popularity in the USA (Raghuram, 2014) and Europe (Pascale Peters, 2003), (Sumita Raghuram, 2010). Initially, telecommuting or distance working meant working from home. Today, this practice is executed in different ways worldwide and does not necessarily mean working from homes. The common attribute of every method is that they offer workers to work from locations geographically away from their workplaces. Remote working is adopted, considering it would be beneficial for both the employees and the employers by providing them with a desired work-life balance and work flexibility. It can save their commuting time and possibly enhance their productivity.

The work culture in India stands opposed and offers a strong resistance towards this notion. The administration culture is still dominantly arranged towards direct management and constant observation of employees. Though there are several reasons such as traffic patterns, increasing women in the workforce and mobile communication facilities that make India the perfect place to make telecommuting a widespread practice, the companies and organizations have not been able to adapt it smoothly. Status driven mentality of the middle-level managers and authorities acts as an obstacle in this transition (Mitter, 2000). To some extent, distance working or working from homes changes the power distribution pattern between employers and employees. In the Indian context, this change can pose an uncomfortable situation for them (Raghuram, Telecommuting in India: Pitfalls and Possibilities, 2014). Due to the pandemic, the practice of work from home, where individuals primarily work from sites that are miles away from central offices, is making inroads into India's work culture today.

In the past, studies conducted to understand how work from home can affect the well-being of the workers pointed various opportunities and challenges this practice offers (Margrethe H. Olson, 1984). The recent studies show similar results in most of the cases (Audronė Nakrošienė, 2019). While extensive researches are being done in western countries, few or no studies exist in the Indian context. Even though few authors have pointed out how India is possibly one of the best places to adopt this practice, because of deep-rooted beliefs and social issues, this did not get implemented on a large scale (Raghuram, Telecommuting in India: Pitfalls and Possibilities, 2014). The research stands different from the existing papers dominantly because this study focuses on remote work when most of the

people in India had no choice but to work from their homes. This study attempts to understand whether the employees are finding it comfortable or challenging to work from home. The paper also attempts to find work from home as a new work culture in India. The results of this study could be noteworthy for the administrative and human resources departments of companies and organizations when they look forward to bring policy changes regarding the implementation of work from home. It could also help other professionals and educators involved in the process of designing programs on work-life balance.

### **Review of Literature**

Several studies and papers focus on various aspects of life and the effects of working away from conventional workplaces. Teleworking, telecommuting and work from home, remote working or distance working are the commonly used terms that refer to the idea of working away from a work place or office building. The studies have also shown conflicting results, where not many researchers support remote work for better work-life balance.

### **Work-Life Balance and Work from Home**

According to the earlier studies (Boas Shamir, 1985), balanced life is when professionals experience satisfaction in professional aspects. Professionals tend to work better when they understand their duties. They do not compromise with their social relationships and wish for minimum interference works in their non-work activities. Even the recent studies(Katarzyna Stawarz, 2013) agree with the approach. Most of the researchers attempt to define a perfect work-life balance and broadly focused on three aspects of life: Professional, Personal and Social (Alan Felstead, 2006), (R. Baral, 2011). The majority of these studies show that working at suitable workplaces can lead to positive impacts both professionally and personally(Marilyw M. Helws, 2002). The professionals experience more flexibility to complete the tasks (Potter, 2003), with an increase in productivity levels, better time management skills, and efficient management of multiple roles (E.JeffreyHill, 2003),(Audronė Nakrošienė, 2019). Women need to look after their duties as well. It enables them to manage both work and home, efficiently without compromising either of them (2014). While research has proved that work from home or a distance to work could lead to positive results, many studies do not support it. They argue that it leads to the overlapping in professional and personal duties(Katarzyna Stawarz, 2013). Recent studies like (Alan Felstead, 2006) seem to agree with earlier studies of (Gronau, 1976) and strongly suggest that working from home strongly affect the leisure time of the working professionals and even lead to a lack of professionalism in the workers. The study of (Maria C. W. Peeters, 2005)shows a strong connection between burnout and work from home.

### **The shift and the service sector**

The Coronavirus (COVID-19) pandemic has likely brought the most widespread change to working society. It forced a large portion of the workers worldwide to telecommute irrespective of their professions. The practice of working away from our offices has become the new normal for people(Basu, 2021). This pandemic

has not only affected all the factors of our life but has left us with some long-lasting challenges as well. There is high uncertainty on when this pandemic period will cease. Almost all kinds of businesses experienced a fall in generating revenues, acquiring new customers/clients, making payments for existing contracts. Some sectors of the economy so badly hit that they have to implement survival strategies rather than thinking of revival or change. There are mainly four sectors of the economy: Primary, secondary, tertiary and quaternary. The primary and secondary sector in India majorly revolves around the extraction of raw materials, agriculture and manufacturing. The tertiary sector deals with the provision of services like retail, communication and IT. Quaternary sectors mainly deal with education, research and development. The tertiary and quaternary sector combined is known as the service sector and it is the largest sector that contributes to the economy in India.

IT and education sectors are probably two of the most prominent sectors and the worst-hit sectors due to the current pandemic. The shift in office culture is apparent. During the pandemic lockdown, the IT sector had to implement work from home for its employees following the rules of the Government of India. It resulted in nearly 90% of professionals working from home, with 65% of them from cities and the remaining 35% from small towns. The transition from the conventional work place to remote work did not affect the business nor the quality and productivity to the surprise of industry leaders and customers alike. (Mitta, 2020).

Within a few months, the Coronavirus (COVID-19) pandemic has changed the education landscape across the nation. These modifications present a roadmap on how education can change for the better in the long term. The state governments of India began shutting down schools and colleges temporarily in the second week of March 2020 to contain the spread of the novel Coronavirus (COVID-19). With no immediate solution to tackle the situation, it affected almost 285 million students across the country (Choudhary, 2020)

The lockdown has compelled many educational institutions to cancel their on-campus activities and choose the online mode of learning. Initially, the educators and the students were quite confused and didn't understand how to cope with the crisis. The situation was analyzed to adapt new strategies to manage the emergence of such pandemics. Thus, COVID 19 PANDEMIC created challenges and opportunities for the educational institutes to strengthen their infrastructure. With high-speed technology becoming dominant, educators and authorities are truly embracing the 'learning anywhere, anytime' concept of digital education in various formats. (Jena P., 2020)

## **Research Methodology**

### **Scheme of the Study**

A study was conducted by circulating questionnaires among one hundred and ten employees and employers of the IT sector and education sector. The questionnaire was created using Google forms and circulated among the working people who live in India through various social media platforms. The main focus of the survey

is on Professional, Personal and Social aspects, the key points that further deal with various spheres of life.

### **Professional aspects**

- Professional performance
- Professional efficiency
- Job motivation
- Workload management
- Job retention (job security)

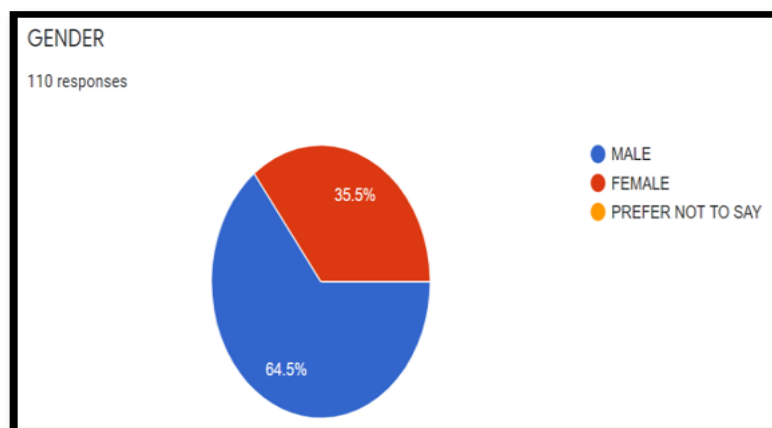
### **Personal aspects**

- Work-life balance
- Personal commitments
- Family relations
- Role management

### **Social aspects**

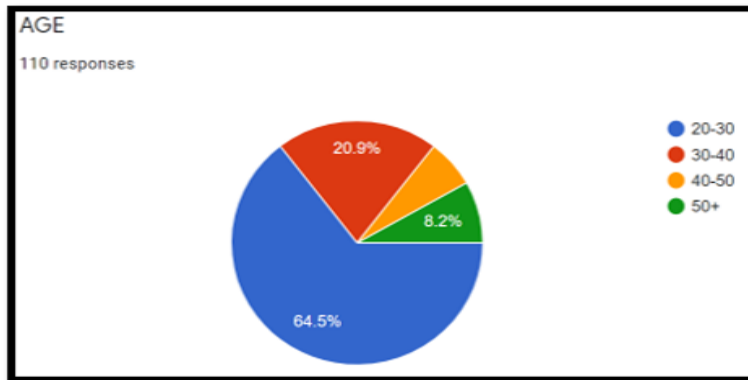
- Peer relation
- Casual outings
- Self-motivation

### **Participants**



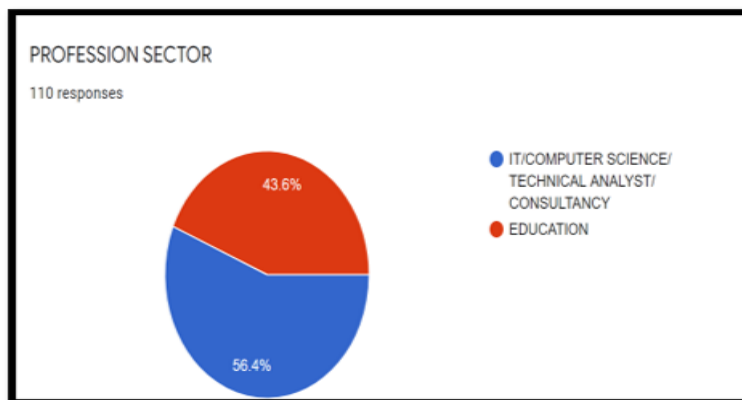
The sample is dominantly male with 71 men and 39 women participants.

Fig 1: Gender



Participants are relatively from a young population where 71 of them in the age group of 20-30 years, 23 participants in the age group of 30-40 years, 7 of them in the range of 40-50 years and 9 participants above 50 years.

Fig 2: Age



62 out of the 110 participants work in IT or Computer science companies/organizations and the remaining 48 participants are a part of the education sector.

Fig 3: Profession Sector

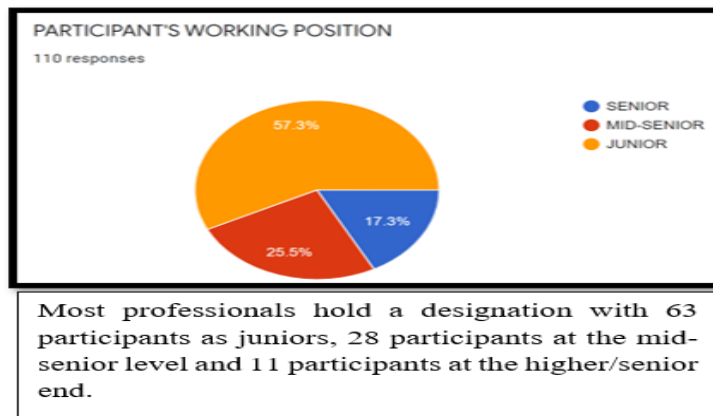


Fig 4: Participant's designation at Work

### Data Analysis

The collected data is analyzed using statistical methods and visualized on R studio, a free software environment for statistical computing. The statistical model discussed in the paper aids in understanding whether the individuals adjust to remote work, a new shift in working culture. The study attempts to answer any significant changes in the professional and personal lives of the participants during the current pandemic. Respondents in the survey have rated the impact of teleworking on aspects of work, personal, family and social life using a 6-point frequency rating scale ranging from '0' (Worst ever) to '5' (Best Ever). The data is analyzed by comparing the differences in the ratings for pre-shift and post-shift situations.

### Statistical Comparisons

Firstly, with a significance level  $\alpha=0.05$  the Shapiro-Wilk test was run to calculate the p-values. Depending on the p-value obtained, the tests to be run were decided and executed.

SERIAL NO	TEST	REMARKS
1	Shapiro-Wilk test	This test is used for analyzing the impact of work from home on various aspects of life.
2	Wilcoxon-signed test for paired samples	This test is applied on the aspects where the p-value of less than alpha value.
3	Paired Sample T-Test	This test is applied on all the aspects when p-value is greater than the alpha.

## Results

### Graphical Analysis

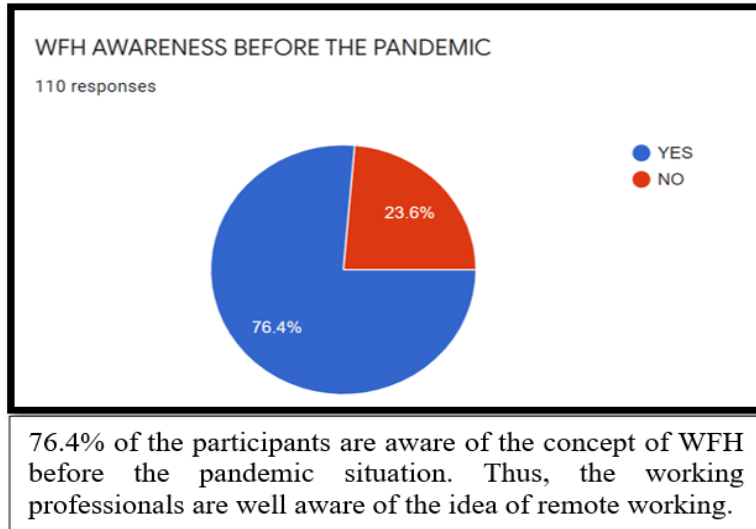


Fig 5: WFH awareness before the pandemic

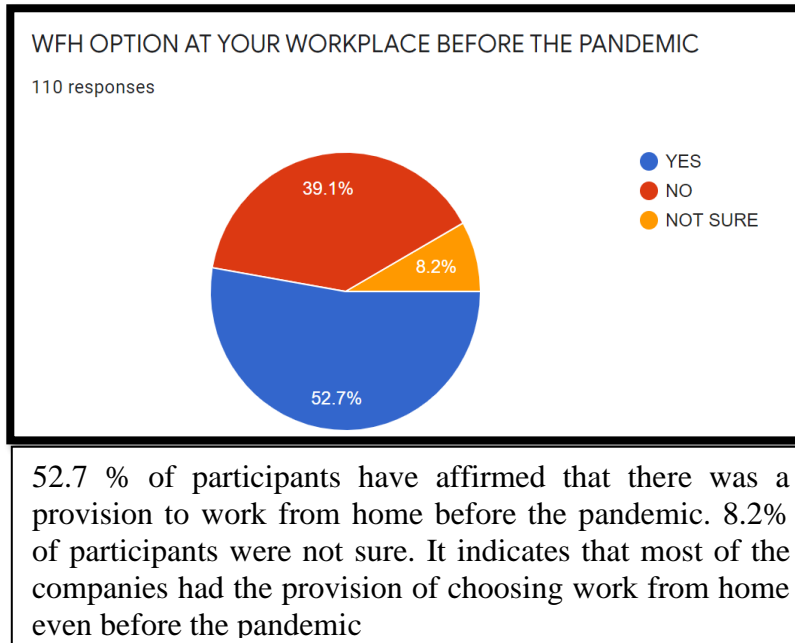


Fig 6: WFH option before the pandemic

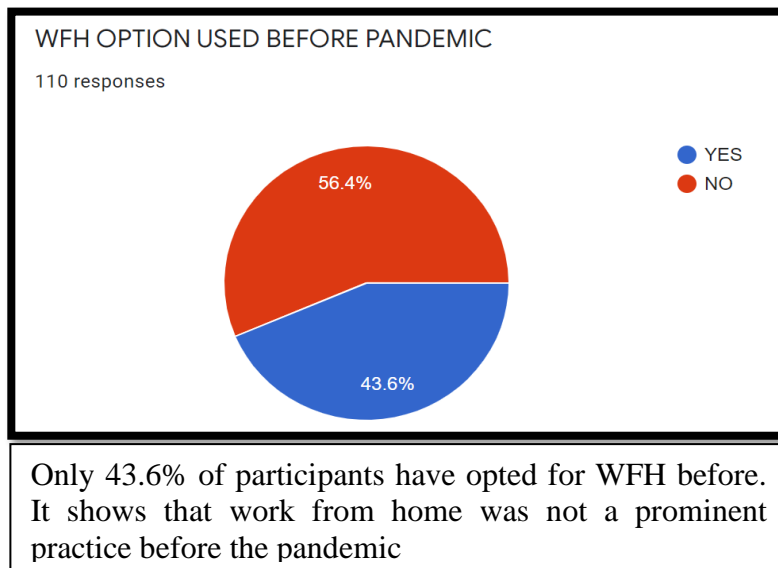


Fig 7: WFH option used before the pandemic4.2. Statistical Analysis

### Average Comparison

Table 1: professional aspects

ASPECTS	WORKING ON WEEKENDS	WORK PRODUCTIVITY	WORK-RELATED STRESS	JOB SECURITY
AVERAGE BEFORE	2.5	4.13	3.44	4.21
AVERAGE AFTER	3.03	3.88	3.85	3.76

ASPECTS	PROFESSIONAL PERFORMANCE	WORKING EFFICIENCY	WORKING TIME	WORKING MOTIVATION	WORKLOAD
AVERAGE BEFORE	4.01	4.16	7.12	4.10	4.10
AVERAGE AFTER	3.87	3.84	7.68	3.70	3.83

Table 2: personal aspects

ASPECTS	WORK-LIFE BALANCE	PERSONAL COMMITMENTS	SLEEP	FAMILY	STRESS
AVERAGE BEFORE	3.89	3.81	7.28	3.72	3.27
AVERAGE AFTER	3.54	3.58	7.43	3.92	3.48

Table 3: social aspects

ASPECTS	MEETING FRIENDS	TIME WITH PEERS	OUTINGS	COMMUTING TIME	STEPPING OUT
AVERAGE BEFORE	6.57	6.52	7	1.66	5.44
AVERAGE AFTER	4.58	4.9	4.64	1.18	5.70

When the individuals were asked to rate on a scale of 1-10, how much they miss socializing? The average was 6.52. Just by looking at the averages, it is hard to comment if the differences are significant. It is also observed that the biggest difference in the averages is in the case of social aspects. Due to the lockdown and the barrier to step outside, majority of participants are ready to continue work from home if given as an option.

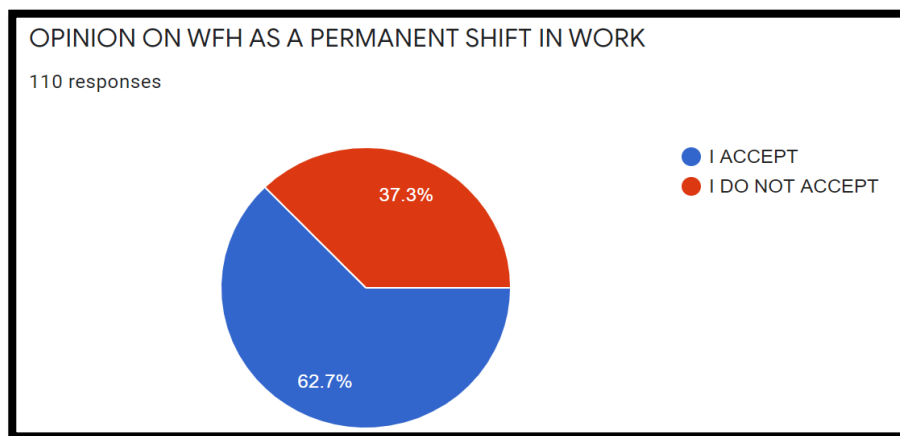


Fig 8: Opinion on WFH as a permanent shift in work

### Deciding comparative test

The results are not significant enough to comment on the impact by calculating the average. To find the significance and analyze further, Shapiro- Wilk test was conducted. The p values were noted and accordingly either the Wilcoxon-Signed test or the paired t-test was run. All the tests were executed on *R studio*, an integrated development environment for *R*. The results of this test are as follows:

Table 1: professional aspects

ASPECT	PROFESSIONAL PERFORMANCE	WORKING EFFICIENCY	WORKING TIME	WORKING MOTIVATION	WORKLOAD
p VALUE	0.0003144	0.00003808	0.02862	0.0003096	0.0001565

ASPECT	WORKING ON WEEKENDS	WORK PRODUCTIVITY	WORK-RELATED STRESS	JOB SECURITY
p VALUE	0.006272	0.003488	0.0002027	0.003011

Table 2: personal aspects

ASPECT	WORK-LIFE BALANCE	PERSONAL COMMITMENTS	SLEEP	FAMILY	STRESS
p VALUE	0.002964	0.0005752	0.02826	0.0008431	0.007979

Table 3: social aspects

ASPECT	MEETING FRIENDS	TIME WITH PEERS	OUTINGS	COMMUTING TIME	STEPPING OUT
p VALUE	0.02661	0.181	0.07198	0.00002313	0.1279

As observed, the professional and personal aspects had a p-value of less than 0.05 and thus, we proceeded with the Wilcoxon test to compare the data. Among the five social aspects, three aspects namely: time invested with peers, frequency in outings and frequency of stepping out to have small breaks while working had a p-value more than 0.05 hence paired t- test was used. Wilcoxon test is used to study the remaining two aspects.

### **Statistical Inference**

After executing the tests as per the p values, the inference is presented in a tabular form:

Table 1: professional aspects

ASPECT	PROFESSIONAL PERFORMANCE	WORKING EFFICIENCY	WORKING TIME	WORKING MOTIVATION	WORKLOAD
p VALUE	0.9387126	0.800302	0.9381878	0.813475	0.2712277

ASPECT	WORKING ON WEEKENDS	WORK PRODUCTIVITY	WORK-RELATED STRESS	JOB SECURITY
p VALUE	0.6360892	0.6641039	0.6975667	0.4916162

Table 2: personal aspects

ASPECT	WORK-LIFE BALANCE	PERSONAL COMMITMENTS	SLEEPING HOURS	FAMILY RESPONSIBILITIES	STRESS
p VALUE	0.2565728	0.8602827	0.1266003	0.2135057	0.22178 14

Table 3: social aspects

ASPECT	FREQUENCY OF MEETING FRIENDS/PEERS	TIME SPENT WITH FRIENDS/PEERS	FREQUENCY OF OUTINGS	COMMUTING TIME	FREQUENCY OF BREAKS
p VALUE	0.4584627	0.7706	0.395	0.500522	0.4396

For the results to be significant in the Wilcoxon-signed test and the paired t-test the value obtained must be smaller than the alpha value i.e., 0.05 but as observed from the table none of the values is significant. This implies that there is no significant change in these aspects before and after the introduction of this practice. The values show that the individuals have been affected but there is no strong evidence of terming it as a significant difference. Thus, it is inferred that individuals have adjusted their lives according to the new changes introduced and there are no significant differences in any of the three aspects: professional, personal and social.

## Conclusion

The study clearly states that people have adopted to remote work, a new shift in work culture. The averages calculated indicate that practice of work from home has affected all three aspects of their lives to some extent. When it comes to personal and professional aspects, not a considerable difference is observed from the results. Although people prefer the conventional office style approach, the present study finds little evidence that work from home has a negative impact on professionals. Out of the three aspects, social relations have been affected the most. It is mainly because of the lockdown restrictions of stepping out. More than sixty per cent of the individuals are open to shifting from office style to work from home or working remotely. With respect to the IT and education sector, the results obtained indicate that this new practice holds the potential to be considered as a long-term change at our workplaces. Though we cannot do away with the office space and the physical space, remote work is here to stay in India. Thus, the study supports remote work option as it allows better work-life balance and increased productivity.

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