



Research on Telework Changes Employees' Stress Levels during the COVID-19 Pandemic

- Specific Potential Stressors are Influencing the General Well-being of Employees

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Abstract. Due to the expansion of COVID-19, a growing number of employees are forced to use telework as a new strategy to cope with the problem of continuing work during this sudden and serious pandemic. Though the research was to investigate the influences of telework on people's well-being in general, the question is under this special pandemic situation, how this sudden transition in the working environment will lead to changes in employees' stress levels specifically. Therefore, this article concentrated on the stress levels and aims to figure out how exactly telework influences employees' stress levels during the COVID-19 pandemic. Furthermore, this article also tries to shed light on whether corporations could consider telework as a work-mode choice for employees to better improve their working efficiency. To a global extent, meta-analysis is used in this article to assess the detailed evidence of the ways that the stress level of employees were influenced by telework during this pandemic. Three main factors were summarized that largely affect stress levels by combing 6171 participants. Results showed a positive correlation between telework and the stress level of employees during the COVID-19 pandemic. In addition, stress levels of employees during forced telework were mainly determined by work-life balance, work-home conflicts, and social interactions, which were significantly correlated with their working efficiency.

Keywords: Telework, Stress, COVID-19, Work-from-home, Employees' well-being

1 Introduction

Driven by the outbreak of coronavirus disease in 2020, telework is becoming more and more common globally as a new work mode in response to the large extent of the forced quarantine at home policy. In a large-scale e-survey research by Ahrendt et al. (2020), nearly half (48%) of their over 10,000 participants reported having worked at least once at home after the beginning of the pandemic[1], and over a third (34%) of them suggested that they do telework exclusively. The number of people who have to work at

home is still increasing as COVID-19 still plays a serious effective role in everyone's life worldwide. This sudden transition of work-mode challenges people's adaptive abilities by changing people's living habits, for instance, physical exercise, sleep duration, alcohol consumption, and so on, which even further reshapes their long-term lifestyles, such as distributions of family responsibility, child-rearing strategies, employment status, and so on [2][3].

Since considering the transition from traditional in-place work to telework, or telecommuting, or work from home (WFH) could cause these different changes to people's lifestyles, many research has been done to investigate how telework influences people's well-being psychologically and physically in different aspects. The results showed both positive and negative effects of telework on people's life in general and caused many debates about this new work style.

On the positive side, telecommuting is a flexible work mode that allows employees to better manage their time, and make better plans to prepare for their work to increase their job performance [4][5]. Also, teleworkers can save more time needed to commute, allowing more time to take care of their family members. This also further improves their work-life balance and job satisfaction [2][6]. Furthermore, some researchers suggested that telework improves people's overall life quality by lowering people's risky behaviors, such as smoking, while increasing healthy behaviors, such as making foods with higher nutrition [2][7]. In addition, WFH enables more vulnerable populations, such as the elderly population, people with disabilities, and single-parent families to join the labor market [1][2].

On the other side, researchers found that these huge changes in work and lifestyles result in many negative consequences, such as unemployment, longer working time, and decreased private spaces [1][5], it also largely influences people's well-being negatively across a broad extent. It also leads to a number of problems mentally and physically, such as depression, anxiety, exhaustion, stiff neck, diarrhea, and dizziness [2][6][7]. There were around 22% of people in the EU at risk of depression, and about 20% of people reported feeling tense and downhearted all or most of the time after the start of the pandemic [1]. Therefore, by considering the extensive and serious influences of sudden and forced telework in this special global situation, more researches need to be done to put more focus on the mental health of employees. They are experiencing such a sudden and challenging transition of work mode that is directly related to every aspect of their life.

Although many researches have been done to identify the factors which contribute to the negative effects of telecommuting, most of the previous research was too broad. Moreover, according to Song & Gao (2020), stress is verified to be associated tightly with telework compared to office work, bringing work home, and non-working [3]. And Weinert et al. (2015) mentioned in their article that stress is considered to be one of the most harmful effects of telecommuting, this article focuses especially on people's stress levels among all the aspects which relate to people's general well-being [8]. And the aim of this study is to verify how telework influences employees' stress levels under the COVID-19 pandemic to a more detailed extent compared to previous studies by figuring out the exact facets of stress levels which are being affected. At last, the possibilities of adopting WFH as an innovative work-mode choice among corporates and

organizations to lower employees' stress levels and improve their performance in the future will also be discussed.

2 Method

2.1 Related articles

This study used systematic review with meta-analysis as the method to investigate the relationship between telework and employees' stress level. 8 researches about quantitative studies were chosen as their results were considered to have close relationships to the aim of this study, and some of their research analyses were similar and could contribute to the further analysis (Table 1).

Shao et al. (2021) aim to find how work-related stressors and COVID-related stressors would predict employees' selections of work locations during the pandemic. They categorized work-related stressors as work-family boundary stressors, work coordination stressors, and workload stressors [9]. And they found that work-family boundary stressors and work coordination stressors were more likely to predict a future choice of office-working, while workload stressors were more likely to predict a choice of telework [9].

In addition, Irawanto et al. (2021) used 2 stressors, which referred to work stress and work-life balance, to propose that although work stress and work-life balance significantly influenced employees' job satisfaction, employees' job satisfaction was improved while they adopt WFH as their work-mode [10].

Another similar research tried to figure out the relationships between WFH and the potential related teleworking stressors, such as work-family conflict, time pressure, and work-related health levels [4]. Their research results showed that the lower level of time pressure got from WFH played a role on positively influencing work-family conflict, which in turn would positively impact employees' general well-being [4].

Furthermore, Arenas et al. (2022) provided more evidence on the positive impacts of WFH, as the study found that telecommuting was more beneficial than working face-to-face, even though it may lead to higher levels of procrastination [6]. There were no differences in burnout levels. Importantly, they pointed out that work-life balances played a crucial role on the general stress level of the employees [6].

Working in the office made employees more vulnerable to the negative effects of the pandemic than telework [5]. Soubelet-Fagoaga et al. (2022) conceptualized the potential work-related stressors as work-family conflict, organizational support, workload, and the ruminative thoughts of COVID-19. They found that work-family conflict and ruminative thoughts were the 2 influential factors on employees' stress levels [5].

On the other hand, in the research of potential work-related stressors (family-work conflict, social isolation, distractions, autonomy, and self-leadership) on employee productivity, engagement, and general stress level caused by WFH during the pandemic influence, Galanti et al. (2021) found that family-work conflict and social isolation were negatively related to WFH productivity, engagement and stress [7].

Moreover, Song & Gao (2020) claims that whether on weekdays or weekends, WFH would lead to a higher level of stress than working in the office. And bringing work

home on weekdays from workplace would result in a lower level of happiness. Adamovic (2022) demonstrated that social isolation can result from social interaction, and this is closely related to the overall stress level of employees [11].

Table 1. List of literature (made by author)

Article	Authors	Sample size	Coefficient & p-value	P
2021	Shao et al. (2021) [9]	127	-0.86	0.03
2021	Darouei & Pluut, (2021) [4]	34	-0.55	0.001
2021	Galanti et.al (2021) [7]	209	0.31	0.01
2022	Arenas, et.al (2022) [6]	435	0.544	0.001
2022	Adamovic (2022) [11]	604	-0.15	0.01
2021	Irawanto, et.al (2021) [10]	472	-0.452	0.05
2019	Soubelet-Fagoaga et al. (2022) [5]	328	-0.19	0.112
2022	Song & Gao (2020) [3]	3962	0.298	0.001

2.2 Data processing

After summarizing the above 8 articles, this study sorted out 3 major common potential work stressors, work-home conflict, work-life balance, and social interaction, to further extract data from the selected articles. The number of participants, and the coefficient between stress and any of the potential stressors were extracted. And the Hedeges' g was calculated to eliminate scale differences, the formula used is listed below:

Formula:

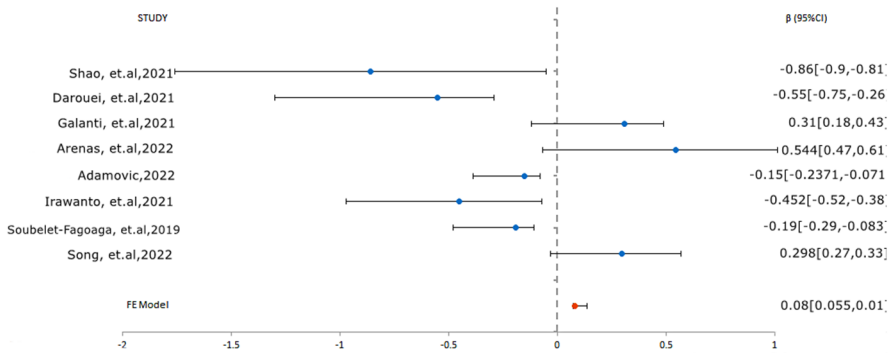
$$\text{Hedeges'g} = \frac{M1 - M2}{SD * \text{pooled}} \quad (1)$$

Moreover, a fixed effect model was chosen in this meta-analysis, and subgroup analysis or meta-regression was used to examine sources of between-study heterogeneity by using Excel. The Pearson correlation (p-value) was used to further describe the relationship between telecommuting and stress levels during the pandemic.

2.3 Result

A positive relationship between telework and stress level was found with a coefficient of 0.08 through the above processes. This result indicates that telework will increase employees' stress levels during this outbreak of COVID-19, and the longer the time of telecommuting, the larger the stress on the employees (See Table 2). The p-value of this meta-analysis was 0.0023 which means that the result was significant.

Table 2. Results of Meta-analysis (made by author)



Among the 8 research studies, there was a range of different facets of stress levels that were split and defined to be affected by WFH. Some of the stressors were verified to play more complex roles as mediators or moderators to further influence participants in deeper ways. In this systematic review, 3 factors of stress levels were sorted out to be related to the intensity of telecommuting the most which refer to social interaction, work-home conflict, and work-life balance as they were considered to be the most common stressors among the selected articles. Although they were defined in different ways in each individual study, similar mechanisms could be found to sort out these different definitions. For instance, the social interaction stressor was described as the feelings of social isolation in 2 out of 8 studies. As a result, social interaction stressor, and work-home conflict stressor were found to be negatively influenced employees' stress level, while work-life balance stressor was shown to be positively correlated to the stress level.

3 Discussion

3.1 Result

A positive correlation between telework and the stress level of employees during the COVID-19 pandemic was found by using Excel (coefficient = 0.08, p = 0.0023). In addition, 3 detailed factors of employees' stress levels were classified to be the most influential reasons among all the different stressors in the included articles, which refers to social interaction, work-home conflict, and work-life balance.

And, social interaction and work-home conflict were negatively correlated to employees' stress levels, but the work-life balance was positively related to the stress level. Unlike previous research that concentrated on a broad range of people's well-being, this systematic review refined its focus on a specific facet of stress level, and sorted out stress levels into more detailed categories (work-home conflict, work-life balance, and social interaction) to synthesize previous results to be more clear.

With this strategy, more detailed and practical policies and new work designs can be made to help employees improve their health conditions while also ensuring employers' benefits. In order to decrease employees' stress levels, the company could try to balance

the work-life by providing more freedom on the daily choices of work mode. And company launches policies to encourage more social interaction while WFH, such as organizing online events, providing up-to-date information about the company, and creating online chat rooms for free talks. This would be another option for corporates to lower employees' stress levels. Furthermore, decreasing work-home conflict could be another way to help employees improve their stress levels. For instance, earplugs could be provided to employees by companies to help decrease distractions from their home environment.

3.2 Limitations

The participants included in this review were from different countries and cultures, like Indonesia, China, and Brazil, and so on, indicating relatively high generalizability of the results.

However, most of the studies summarized in this article included the use of self-reported questionnaires as their main method to evaluate participants' stress levels. And all of the included studies were cross-sectional studies, meaning that only correlational relationships can be defined in these researches, and no causal relationships can be verified. Furthermore, different researchers define and split social interaction, work-home conflict, and work-home balance in quite different ways, which can lead to different choices of rating methods that are sometimes not sufficiently standardized and validated. In addition, most of the selected sample sizes of the included studies were quite small, one study only included 34 participants [4], so the significance of each study should take some concern. Moreover, there were other compounds that could potentially influence the results of the included research studies, such as the personality characteristics of the individual employees, attitudes towards COVID-19.

3.3 Future Directions

As mentioned above, because the selected research studies in the meta-analysis were cross-sectional studies, it was not possible to verify causality to show elements that increase employee stress levels while adopting WFH as their new work mode. Future research could try to conduct studies to find causal relationships between these two factors to better help employees deal with the increasing stress of telework during this special period of the COVID-19 outbreak. Moreover, the potential compounds and bias should be considered, so that future research could be done to investigate the relationships between stress levels, telecommuting, and the compounds of this study, or conduct research with strict control to lower the influence of these compounds. In addition, although as been found in this systematic review, there were 3 specific stressors that showed the tightest relationships to stress level, more evidence needs to be found to draw stronger conclusions. Thus, future research could try to conduct study designs to provide more evidence along these specific results of this review to support policy-making government and relevant organizations stay in line with clear routines, especially during this continuous and serious period of the COVID-19 pandemic.

Furthermore, this review also sheds light on new possible work management designs for corporates and employees in the future. As been found in this analysis, even though social interaction and work-home conflict negatively affect stress levels, the improvement of work-life balance positively affects stress levels which are considered to be one important reason for employees to continue WFH [12]. Moreover, WFH could provide a win-win situation for employees and companies by the increased working efficiency and satisfaction among employees led to an improvement in the company's profits [12]. However, Bloom et al. (2015) discovered that after telecommuting for 9 months, although their participants showed an increase in work performance (13%), and a decrease in attrition (50%), when they were asked to reselect their work mode, half of the participants chose to return to office-work [13]. Similarly, employees' willingness to continue teleworking was reported to decrease because of exhaustion and overworking [8]. Therefore, these results lead to the debate of whether companies could consider making telework an optional work management choice for employees. In order to lower employees' stress to promote their health level and life quality while also increasing companies' profits, WFH should become a new workstyle, but not in an exclusive way. Corporations could consider adopting telework as an optional choice of work mode in a daily pattern to combine this new work mode with the traditional office-work style. More research could be done to figure out the possibility and efficacy of this innovative combination of telework and work in the office.

4 Conclusion

This systematic review verified that there was a positive correlation between employees' stress levels and telework after the sudden explosion of coronavirus. Meta-analysis was used by including 8 research studies, and 3 specific categorical stressors were sorted out, in order to understand how exactly stress level was influenced by telework to a deeper extent. These 3 stressors refer to social interaction, work-home conflict, and work-family balance. However, there were still many limitations of this study, further research needs to be conducted to get more evidence to better support policy-makers to stay on a clear and validated track which could give employees more practical help under this special global situation.

5 References

1. Ahrendt, D., Cabrita, J., Clerici, E., Hurley, J., Leončikas, T., Mascherini, M., Riso, S., Sándor, E., (2020), *Living, working and COVID-19 series*, Eurofound, Publications Office of the European Union, Luxembourg. <https://www.eurofound.europa.eu/publications/report/2020/living-working-and-covid-19>.
2. Niu, Q., Nagata, T., Fukutani, N., Tezuka, M., Shimoura, K., Nagai-Tanima, M., & Aoyama, T. (2021). Health effects of immediate telework introduction during the COVID-19 era in Japan: A cross-sectional study. *PloS one*, 16(10), e0256530.

3. Song, Y., & Gao, J. (2020). Does telework stress employees out? A study on working at home and subjective well-being for wage/salary workers. *Journal of Happiness Studies*, 21(7), 2649-2668.
4. Darouci, M., & Pluut, H. (2021). Work from home today for a better tomorrow! How working from home influences work-family conflict and employees' start of the next workday. *Stress and Health*, 37(5), 986-999.
5. Soubelet-Fagoaga, I., Arnosó-Martínez, M., Elgorriaga-Astondoa, E., & Martínez-Moreno, E. (2022). Telework and Face-to-Face Work during COVID-19 Confinement: The Predictive Factors of Work-Related Stress from a Holistic Point of View. *International Journal of Environmental Research and Public Health*, 19(7), 3837.
6. Arenas, D. L., Viduani, A., Bassols, A. M. S., & Hauck, S. (2022). Work From Home or Bring Home the Work? Burnout and Procrastination in Brazilian Workers During the COVID-19 Pandemic. *Journal of Occupational and Environmental Medicine*, 64(5), e333-e339.
7. Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., & Toscano, F. (2021). Work from home during the COVID-19 outbreak: The impact on employees' remote work productivity, engagement, and stress. *Journal of occupational and environmental medicine*, 63(7), e426.
8. Weinert, C., Maier, C., & Laumer, S. (2015). Why are teleworkers stressed? An empirical analysis of the causes of telework-enabled stress.
9. Shao, Y., Fang, Y., Wang, M., Chang, C. H. D., & Wang, L. (2021). Making daily decisions to work from home or to work in the office: The impacts of daily work-and COVID-related stressors on next-day work location. *Journal of Applied Psychology*, 106(6), 825.
10. Irawanto, D. W., Novianti, K. R., & Roz, K. (2021). Work from home: Measuring satisfaction between work-life balance and work stress during the COVID-19 pandemic in Indonesia. *Economies*, 9(3), 96.
11. Adamovic, M. (2022). How does employee cultural background influence the effects of telework on job stress? The roles of power distance, individualism, and beliefs about telework. *International Journal of Information Management*, 62, 102437.
12. Tunk, N., & Kunar, A.A., (2021), Work from home - A new virtual reality, *Current Psychology*, 1-13.
13. Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165-218.

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