“Enabling” or “Burdensome”: The Double-edged Sword Effect of Telecommuting on Employee Health

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Abstract. With COVID-19 epidemic prevention and control entering into the regular state in China, flexible working schedule, featured by telecommuting, has been chosen by a large number of enterprises as an emergency work measure to ensure the normal operation of enterprises. For further analysis of effects on health of employees telecommuting, according to JD-R model, this paper constructs the telecommuting employee health impact of theoretical model, 225 valid questionnaires of the research results show that the telecommuting have a Double-edged effect on the employees physical and mental health effects of path, and employee Self-efficacy play a mediating role in this path. When telecommuting is manifested as work resources, employees will be willing to consume personal resources, improve work enthusiasm and participation, and Self-efficacy can be effectively played, and promote the improvement of employees' health level; on the contrary, it goes down. The research results will provide new ideas and new perspectives for the research on the adjustment of enterprise employment mode, the creation of employee Self-efficacy and the sustainable and healthy development of organizations under the background of the normalization of epidemic prevention and control.

Keywords: Telecommuting; Employee Health; Employee Self-efficacy; Job Demands-resources Model.

1. Introduction

Since the outbreak of the COVID-19 in early 2020, many countries have introduced corresponding strong containment measures, such as city closures, mandatory home protection for residents, and bans on free travel. In response to this important national epidemic prevention and control measure and to maximize the normalization of production and operation, many companies have adopted telecommuting as an emergency working mechanism. According to data, by the end of March 2020, more than 3.4 billion people in 84 countries will be under mandatory home quarantine, which means that millions of employees will be telecommuting as a regular mode of work during an epidemic (Bouziri et al., 2020). The concept of telecommuting can be traced back to the 1970s, from the initial focus on the change of workplace only to the subsequent increase in the focus on the change of work methods such as the use of communication tools and information technology, reflecting the continuous evolution of the connotation and characteristics of telecommuting in the information age. Through literature review, in the past, organizations and employees who chose telecommuting work style often made the active choice out of the consideration that they could arrange their work and life flexibly (Huo., Gong, Li, Nie, 2020). And in the context of this global epidemic environment, the impact on employees as a primary mode of work that is a passive choice becomes a keen concern for many research scholars and business managers.

Since the advent of telecommuting, it has been recognized as a new way to meet employees' needs for a healthy work-family balance compared to working in a normal office environment (Shamir & Salomon, 1985). On the positive aspect, telecommuting increases employees' ability and flexibility to cope with their work, which in turn increases their job satisfaction and sense of control, reduces their work stress, and positively affects their physical and mental health (Diaz et al., 2012; Richardson & Thompson, 2012). However, at the same time, it has also been shown that because telecommuting may require individuals to continue to cope with work stress outside of regular work hours, individuals are unable to adequately manage the "work-family" balance and are unable to adequately fulfill their family responsibilities and recover physically and mentally, which leads to a

depletion of personal resources and thus reduces well-being at work (Shi et al., 2018), which has a negative impact on employees' health. Thus, based on the previous literature review, it is evident that telecommuting has both positive and negative effects on employee health, and its impact path has a Double-edged sword effect. The Job Requirements-Resources model (hereafter referred to as the JD-R model) theorizes that each occupation has unique factors that affect the physical and mental health of workers and their work status. The various job characteristics can be divided into two main categories: work demands and work resources. Work demands are the main predictor of the health impairment process, and prolonged and intense work demands have a negative impact on employees' health at both physical and psychological levels. In contrast, work resources involving physical, psychological, social, and organizational aspects motivate work, promote high levels of work engagement, and mitigate the negative effects of work demands on employees' health (Bakker & Demerouti, 2007). Therefore, this paper argues that the impact of telecommuting on employee health, as a new work style popularly adopted in China in the context of epidemic prevention and control, depends on the judgment of telecommuting as a work attribute.

Related research, based on the perspective of individual resource preservation, suggested that telecommuting can help individuals increase their sense of control and autonomy and enhance their Self-efficacy when it is expressed as a valuable resource (Matos & Galinsky, 2015; Sweet et al., 2017). Numerous empirical studies have found a strong association between Self-efficacy and both physical and mental health factors, as evidenced by the fact that individuals with high Self-efficacy tend to show higher levels of positive mental health factors (life satisfaction, self-esteem, and positive affect) and lower levels of negative factors (loneliness, depression, anxiety, and negative affect) (Li, Ran, Zhang, Hu 2019; Chang et al., 2018; Jiang et al., 2017; Liu et al., 2018; To, 2016; Wang & Zhang, 2017). Therefore, this study focused on employee Self-efficacy as a mediating variable to explore its mediating role in the impact of telecommuting on employee health.

The study explores the Double-edged sword effect of telecommuting on employee health in a dynamic perspective based on the JD-R model. First, the relationship between telecommuting and employee health is examined; second, the mediating variable Self-efficacy is introduced to explain the impact path of telecommuting on physical and mental health based on the JD-R model, and the theoretical model of this paper is proposed; again, the research hypotheses given in the theoretical model are tested using questionnaire data from 269 employees in 54 locations; finally, the findings are discussed, and the limitations of this study and future research outlook are given. This paper incorporates telecommuting into the context of the COVID-19 epidemic, with the intention of identifying ways in which companies can apply telecommuting while maintaining the physical and mental health levels of their employees, in the hope of providing constructive reference and value for companies to view the effectiveness of telecommuting in a balanced and comprehensive manner, thus promoting the maximization of the value of telecommuting work resources in the present and future when epidemic prevention and control is normalized.

2. Literature Review and Research Hypothesis

2.1 Telecommuting and Physical and Mental Health

Telecommuting refers to the use of modern information and communication technologies such as smartphones and computers by employees during regular working hours to handle work matters in a location other than the workplace (Huo, Gong, Li, Nie, 2020). Regarding the choice of telecommuting mode, there are active antecedents of choice at the employee level, such as employees avoiding interruptions, individual employee characteristics including but not limited to gender, age, income, marital status, and other factors, as well as active antecedents of choice at the organizational level, such as departmental functions, size, industry characteristics, and organizational culture (Huo, ,Gong, Li, Nie., 2020; Lyness et al., 2012; Leslie et al, 2012; Peretz et al., 2018). In addition, the adoption of telecommuting by companies includes some passive choice antecedents. In the face of changes in the external environment that prevent the organization's daily work mechanisms from operating

effectively, such as this new crown pneumonia outbreak, companies consider telecommuting as a contingency measure to keep the company operating at maximum normalcy. In summary, it can be seen that the factors affecting telecommuting in enterprises can be considered at two levels: employee and enterprise, and also from the perspective of active and passive choices of enterprises. The influence mechanism of telecommuting can be expressed at different levels, mainly at the level of social organizations and individual employees.

The effect of telecommuting on the organization is mainly at the level of organizational performance, organizational competitiveness, and total social benefits, while the effect on employees is mainly at the level of employees' work attitude, employees' work behavior, employees' family performance, employees' career development, and employees' physical and mental health (Sun, Cui, Song, 2020). The lasting and sustainable development of enterprises requires healthy, active and efficient employees as strategic capital; therefore, this paper explores the mechanism of telecommuting's impact on employee health based on the JD-R model theory. Individual health in an organization, i.e. employee health, requires not only physical health and mental health, but also job satisfaction. In other words, employee health is expressed as subjective satisfaction (job satisfaction) and objective health (physical health and psychological health) of employees. Physical and mental health mainly refers to physiological and psychological health. Physiological health mainly refers to the normal indicators of physical quality in all aspects, work vigor and energy. Mental health, on the other hand, refers to employees with high intrinsic satisfaction, optimism about their personal work, and a strong sense of accomplishment, while poor mental health is manifested by employees with many negative emotions, high stress from work or even anxiety and depression (Wang and Chen, 2008; McHugh & Brotherton, 2000; Jaffe, 1995; Park et al., 2011). The long-term sustainable development of an enterprise cannot be achieved without the support of healthy and efficient employees. At the same time, the health status of employees has an important impact on the achievement of organizational goals and development of the company. Studies have shown that promoting employee health can help improve productivity and maintain production continuity; it can reduce cost expenditures and ensure the financial success of the organization; it is about the social image of the organization and is a strategic investment with business value (Wang and Chen, 2008).

Existing studies have classified the effects of telecommuting on employees' physical and mental health into positive and negative aspects. In terms of positive aspects, some studies have found that telecommuting increases employees' flexibility and autonomy in coping with their work, reduces the tension and stress caused by the strong constraints of the previous work system, which in turn increases employees' job satisfaction and their physical and mental health (Diaz et al., 2012). However, it has also been shown (Boswell & Olson-Buchanan, 2007; Derks et al., 2015; Lanaj et al., 2014; Schieman & Young, 2013; Derks & van Mierlo & Schmitz, 2014; Derks & Bakker, 2014; Dettmers et al., 2016), as this new type of office can create obstacles to employees' psychological detachment from work and may require individuals to continue to cope with work stress outside of regular work hours, triggering "work-family" conflict, which can lead to negative health problems such as insomnia, depression and other physical problems, as well as a large number of psychological problems such as emotional exhaustion and burnout. Therefore the following hypothesis is proposed.

H1a: The impact of telecommuting on employee health varies in its different manifestations.

According to the theory of JD-R model, work resources refer to work factors that can help individuals achieve their goals, relieve physical and psychological exertion brought by work demands and promote personal growth and improvement, such as physical, psychological, social or organizational factors that can provide support and assistance to workers. Work demands are factors related to physical, mental, social or organizational that are associated with physical and mental exertion and require continuous physical or mental effort. It mainly includes workload, role conflict, and emotional demands (Demerouti et al., 2001). There is research evidence that a balance between work demands and work resources will improve employees' physical health and maintain productivity (Bakker et al., 2003). Therefore, for the purpose of further research, this paper categorizes telecommuting work into two categories: work resources and work demands. Therefore, for the

purpose of further research, this paper categorizes telecommuting into two categories: work resources and work demands. When telecommuting is considered as a work resource, the use of work-based communication tools makes it easier and faster for employees to complete work tasks, thus increasing work efficiency, satisfying employees' autonomous work demands, and allowing them to work in a more positive and enjoyable mood. At the same time, online telecommuting will also make employees more goal-oriented, reduce the previous interruptions and unnecessary social activities in the normal corporate office environment, and increase their job satisfaction and sense of control. In addition, the use of work-based communication tools makes employees more productive, and after work goals are accomplished, employees can enjoy rest, relaxation, fitness and recreation activities in the remaining time after tasks are completed to maintain a good mental state. These work resources brought about by telecommuting can help achieve personal resource gains for employees, reduce physical and mental attrition, increase job satisfaction and well-being, as well as employee's health (Schaufeli & Taris, 2014). In summary, this paper proposes the following hypothesis.

H1b: When telecommuting is manifested as work resource A1, it has a positive impact on employee health level.

When telecommuting is regarded as a work demand, its impact on employees' health is mainly manifested in the following aspects: telecommuting makes employees lack continuous and stable social interaction online, which reduces communication efficiency and increases the difficulty of work task completion; at the same time, telecommuting brings certain convenience to employees' work by virtue of the convenience of work task release and employee communication, but also carries some potential risks. For example, telecommuting may make employees forced to respond and deal with work matters outside of regular working hours, which will lead to a reduction in time for employees to spend with their families and relax. The boundary between "work-family-life" becomes blurred, and employees' own resources are further depleted, thus reducing their job satisfaction and happiness. If work resources are not replenished, employees may also develop negative emotions such as anxiety, which may exacerbate their physical and mental health (Schaufeli et al., 2009). As a result, the following hypothesis is proposed.

H1c: When telecommuting is manifested as job demand A2, it has a negative effect on employees' health level.

2.2 The Mediating Role of Self-efficacy

Self-efficacy refers to the beliefs people have about what they can do or how sure they are that they can perform an action (Li, Ran, Zhang, Hu, 2019; Skaalvik & Skaalvik, 2017). Related studies have shown that employees with high Self-efficacy are more likely to achieve personal value by reaching their work goals thereby enhancing their job well-being. In addition, Self-efficacy also helps to alleviate the negative effects of job stress on individuals (Schaubroedk & Lamssk, 2000), while employees with low Self-efficacy tend to develop negative emotions such as anxiety and doubt when facing job stress, which negatively affects employees' health, employees with high Self-efficacy tend to turn stress into motivation and instead develop a positive emotion of facing to difficulties, which in turn leads to more job fulfillment and satisfaction, and has a positive impact on employees' health. Therefore, the following hypothesis is proposed.

H2a: Self-efficacy has a positive effect on employees' health level. The higher the Self-efficacy of employees, the better their health level is.

When telecommuting is expressed as a work resource, employees can complete their work tasks easily and quickly through work communication tools through flexible time and location, and their work efficiency is greatly improved. Work tasks can be completed efficiently with the support of remote collaboration software, which is seen as a positive work signal by employees, creating an optimistic work mood and increasing their confidence in accomplishing their work goals. At the same time, telecommuting satisfies employees' need to work autonomously and reduces unnecessary interruptions, allowing more energy to be devoted to the completion of work tasks.

These resources will help employees to improve their Self-efficacy (Mazmanian et al., 2013) and promote the accomplishment of individual goals and work objectives. When telecommuting is manifested as a job demand, employees need to consume a lot of individual resources such as emotions and energy to cope with it, which may lead to negative emotions such as anxiety and doubt, and reduce confidence in accomplishing work goals, and employees' motivation will decrease accordingly. In addition, if employees are forced to respond and deal with work matters outside of regular working hours during telecommuting, it will reduce their rest time for physical and mental recovery and cause "work-family" conflict, which will further impair their Self-efficacy and is not conducive to the completion of individual and work goals. In summary, the following hypotheses are proposed.

H2b: When telecommuting is expressed as work resource A1, it has a positive effect on Self-efficacy.

H2c: Telecommuting has a negative effect on Self-efficacy when it is expressed as work demand A2.

H2d: Self-efficacy plays a mediating role in the relationship between telecommuting and health.

Based on the above hypotheses, the following theoretical model is proposed, as shown in Figure 1

Figure 1. Theoretical Model

3. Research Methodology

3.1 Data Collection and Study Subjects

This study used an online questionnaire survey in February 2021 to survey employees from 54 locations including Beijing, Zhengzhou, Chengdu, and Chongqing who had used telecommuting during the epidemic (the data sources listed above were from cities with larger sample sizes). The staff of the enterprises and institutions were consulted before the start of the survey, and the principle of confidentiality was reiterated to the subjects during the formal survey, and they were informed that the results of the study would be used for academic research only. A total of 269 samples were collected in this study, and 225 valid questionnaires were obtained after eliminating invalid questionnaires, with an effective rate of 83.64%. Descriptive statistical analysis of the sample showed that 54 males accounted for 24%, 171 females accounted for 76%, and the ratio of males to females was close to 1:3; 87.1% of the interviewed employees were married; 55.1% of the employees were under 45 years old, 68.9% of the interviewed employees had more than 15 years of working experience; 71.1% of the employees were in institutions, 9.3% are employees of state-owned enterprises, 10.2% are private enterprises, and 9.3% are foreign-funded enterprises, non-profit organizations and other types of organizations.

3.2 Measurement Tools

To ensure the reliability and validity of the measurement instruments, this study referred to the established Chinese and English scales for the research, which were scored on a Likert-5-point scale,

with scores of 1 to 5 indicating strongly disagree, disagree, uncertain, agree, and strongly agree, respectively. The "employee health" variables were measured with reference to the 18-item scale developed by Frone et al. (2015) and the 9-item scale developed by Liu et al. (2007), which included "Telecommuting often exhausts me", "I think telecommuting reduces my workload", and "I think telecommuting reduces my workload". "I believe that telecommuting has reduced anxiety and tension in previous work situations". The "Self-efficacy" variable was measured with reference to the 6-item scale developed by Lapierre et al. (2015), which included questions such as "I am confident that I can effectively cope with any unexpected situation in a telecommuting situation. The "telecommuting" was measured separately for two variables, "work resources" and "work demand", and was developed by referring to the relevant literature (Wang & Zhang, 2017; Wang, Liu, and Li 2019), with a total of 8 items. The "work requirements" scale mainly includes questions such as "Telecommuting prevents me from doing the things I want to do at home".

4. Study Results

4.1 Descriptive Statistics and Correlation Analysis of Study Variables

This study began with descriptive statistical analysis of the data. The means, standard deviations and correlation coefficients among the variables involved in the study are shown in Table 1, from which it can be seen that there is a two-by-two correlation between telecommuting, employee health and Self-efficacy variables. Work resources and Self-efficacy were positively correlated ($r = 0.415$, $p < 0.01$), work demand and Self-efficacy were negatively correlated ($r = -0.224$, $p < 0.01$), work resources and employee health were positively correlated ($r = 0.491$, $p < 0.01$), and work demand and employee health were negatively correlated ($r = -0.320$, $p < 0.01$). Self-efficacy and employee health were positively correlated ($r = 0.685$, $p < 0.01$).

Table 1. Descriptive Statistics

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1 Gender	1.76	0.428									
2 Age	3.10	1.013	-0.244**								
3 Years of work	3.35	1.088	-0.221**	0.872**							
4 Marriage or not	1.87	0.336	-0.185**	0.746**	0.796**						
5 Unit type	1.72	1.388	-0.010	-0.110	-0.149*	-0.223**					
6 Work resources	11.67	2.785	0.000	-0.058	-0.019	-0.003	0.205**				
7 Job Requirements	15.33	4.933	0.095	0.041	0.044	0.058	-0.206**	-0.281**			
8 Employee Health	19.19	4.199	-0.144*	0.072	0.082	0.093	0.077	0.491**	-0.320**		
9 Self-efficacy	18.15	3.752	-0.121	0.055	0.026	0.014	0.117	0.415**	-0.224**	0.685**	

Note: $n=225$; * at the 0.05 level (two-tailed), significant correlation; ** at the 0.01 level (two-tailed), significant correlation; *** at the 0.001 level (two-tailed), significant correlation; Table 2 is the same.

4.2 Hypothesis Testing

To test the hypotheses, this study used SPSS26.0 software and cascade regression for hypothesis testing, and the data fit the model well, which are shown in Table 2. M1 and M4 tested the relationship

between control variables and Self-efficacy and employee health, respectively. M5 and M6 tested H_{1b} and H_{1c} , and the results showed that "telecommuting-work resources" H_{1b} and H_{1c} hold. M2 and M3 test the relationship between H_{2b} and H_{2c} , and the results showed that "telecommuting-work resources" has a significant positive effect on employees' health ($r=0.316$, $p<0.001$) and "telecommuting-work demand" has a significant negative effect on employees' health ($r=-0.143$, $p<0.001$). H_{2c} , the results showed that "telecommuting-work resources" had a significant positive effect on employee Self-efficacy ($r=0.402$, $p<0.001$), and "telecommuting-work demand" had a significant negative effect on employee Self-efficacy ($r=-0.235$, $p<0.001$), H_{2b} , H_{2c} holds. M7 test H_{2a} , the results show that employee Self-efficacy and employee health are significantly negatively correlated ($r=0.637$, $p<0.001$), H_{2a} holds.

Table 2. Results of Regression Analysis for Hypothesis Testing

Category		Self-efficacy			Employee Wellness			
		M1	M2	M3	M4	M5	M6	M7
Control variables	Gender	-0.228	-0.224*	-0.172	-0.180	-0.177	-0.146	-0.035
	Age	-0.041	0.040	-0.030	0.071	0.135	0.078	0.097
	Years of work	0.021	-0.016	0.019	-0.044	-0.072	-0.045	-0.057
	Marriage or not	0.244	0.104	0.246	-0.004	-0.115	-0.003	-0.160
	Unit type	0.053	-0.007	0.020	0.059	0.011	0.039	0.025
Independent variables	Telecommuting-work resources		0.402***			0.316***		
	Telecommuting-work demand			-0.235***			-0.143**	
Mediating variable	Self-efficacy							0.637***
R^2		0.035	0.268	0.126	0.031	0.197	0.069	0.481
ΔR^2		0.013	0.248	0.101	0.009	0.175	0.044	0.466
F-value		1.583	13.300	5.216	1.396	8.907	2.710	33.645

5. Discussion

5.1 Conclusions of the Study

First, the effect of telecommuting on employees' health has a Double-edged sword effect. When telecommuting is seen as a work resource by employees, it has a positive impact on employees' physical and mental health, job satisfaction and job well-being; when telecommuting is seen as a work demand by employees, it has a negative impact on employees' physical and mental recovery, health and job satisfaction. Based on the JD-R model, this paper classified telecommuting into work resources and work demand according to its attributes, which makes the path of its influence on employees' health clearer and more explicit. The empirical study confirms that employee health is an important outcome variable of telecommuting, broadens the research on the effects of telecommuting, and provides creative insights for a deeper understanding of the connotation and practical value of telecommuting.

Second, this study confirms the partially mediating role of Self-efficacy between telecommuting and employee health. Most of the current studies on the relationship between telecommuting and employee health are direct effect explorations, without further revealing the "black box" of the mechanism of action between the two. Self-efficacy, as a positive and effective resource, promotes employees' physical and mental health, job satisfaction and fulfillment by increasing their motivation and creativity and reducing the stress caused by work demands. The use of this mediating variable enriches the theoretical study of the mechanism of telework and employee health, and provides some reference value and inspiration for enterprises to strengthen employee Self-efficacy training and the

implementation of related employee assistance programs, and to correctly utilize the resource value of telework.

5.2 Management Suggestions

This study has certain guiding significance for enterprises to use telecommuting as a working mode in the present and future when epidemic prevention and control is normalized.

First, enterprise managers should recognize the dual impact of telecommuting on employees' health, reduce the work requirements of employees during telecommuting, and pay attention to strengthening the training of employees' time management. Because telecommuting blurs the boundary between "work status" and "off-duty status", employees working at home are prone to "daytime laziness" and "night overtime" is a bad phenomenon. Therefore, managers can follow up and monitor the work progress of employees in real time by adopting advanced information and communication equipment or schedule collaboration software to ensure that employees have spare time for rest, relaxation and family activities after completing their tasks efficiently during working hours. In addition, for most employees, the biggest advantage of telecommuting is that it saves commuting time and increases the amount of free time at their disposal after work. Employees can use this time to lift themselves or relax and keep their spirits up, and these activities can have positive benefits on their physical and mental health.

Second, companies need to play the value of telecommuting work resources. Telecommuting, as a new work norm in the Internet era, has the advantage of easily breaking the traditional team structure and building temporary collaborative teams for specific projects. This requires that companies should have Internet thinking, continuous innovation, and the use of advanced work communication tools to enhance communication and collaboration among employees. It should enable employees to complete their work tasks more easily and quickly, and improve their work efficiency. At the same time, this can also enable employees to reduce unnecessary social distractions, which in turn enhance employee job satisfaction and happiness, and promote the healthy and sustainable development of enterprises.

Third, companies should pay attention to the positive effects of employee Self-efficacy on employee health. In addition to enhancing employees' Self-efficacy as an important resource through telework resourcefulness, enterprises should also strengthen psychological care for employees, pay attention to cultivating employees' self-confidence and optimistic beliefs, and promote the gaining effect of Self-efficacy on employees' health level by stimulating work motivation.

5.3 Research Limitations and Outlook

This study also has certain limitations that need to be overcome and improved by subsequent studies. First, due to the strict control of domestic epidemic prevention and control during the survey period, questionnaires were mainly distributed online to collect data, which led to a slight shortage of the sample of subjects in this study in terms of quantity. In addition, the sample is cross-sectional, and future studies can collect data at different time points to improve the accuracy and rigor of the study. Second, the attribute classification of telecommuting needs to be further explored. This paper only classifies telecommuting as a work resource and a work demand based on the consistency of employees' work goals and personal goals. Future research could consider the possibility of non-linear effects of telecommuting on employees' health when it is both a work resource and a work demand (i.e., challenging work demand). In addition, related research can also explore whether the relationship between telecommuting and employee health is influenced by other mediating variables such as work-family gain and work access, in order to further enrich and expand the theoretical research and help companies develop more scientific, variable and humanized management measures.

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